India and Sustainable Development Goals: The Way Forward

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RIS
Research and Information System for Developing Countries
विकासशील देशों की अनुसंधान एवं सूचना प्रणाली

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MESSAGE

Smt. Sushma Swaraj
Minister of External Affairs, India

श्रीमती सुषमा स्वराज
विदेश मंत्री, भारत

सत्यमेव जयते

MESSAGE

India attaches high priority to the 2030 Agenda for Sustainable Development which the United Nations adopted unanimously in September 2015, and which will have great significance for the well-being and progress of humankind. I would like to underline India's strong commitment to the holistic implementation of the 17 Sustainable Development Goals (SDGs) which mirror substantially our own flagship programmes and priorities. Inter-stakeholder consultations to create a suitable policy framework for realising the SDGs have been initiated to this end.

To contribute to the policy debate on the implementation of the SDGs, the Research and Information System for Developing Countries (RIS) has organised a number of Consultation Meetings. As part of this useful exercise, this set of papers has been compiled by the RIS drawing on the expertise of eminent policy analysts and administrators.

I am confident this Compilation will serve as a valuable resource for those engaged with the implementation of the 2030 Agenda and as an aid in evolving effective policy cohesion at the Centre and State levels.

I compliment RIS for this commendable effort and convey my best wishes for the important task ahead.

Sushma Swaraj

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FOREWORD

Ambassador Shyam Saran
Chairman, RIS

Research and Information System for Developing Countries (RIS) has been playing a pioneering role in contributing to the domestic and international debate on the effective implementation of the agenda of the Sustainable Development Goals. The Institute has organized a number of Consultation Meetings with NITI Aayog, the UN Office in New Delhi, other departments of the Governments both from the Centre and States, Civil Society Organisations and Academic institutions on different aspects of SDGs.

Apart from these active engagements, RIS has brought out a set of 19 papers dealing with different dimensions of SDGs. They also cover the related and important areas of technology facilitation mechanism and financing for development. I compliment all the experts who have prepared this valuable set of papers.

I firmly believe that policymakers both at the Centre and State government levels and others working for fruitful implementation of SDGs agenda would find this Volume generated by RIS a useful policy research input.

Shyam Saran

PREFACE

Prof. Sachin Chaturvedi
Director General, RIS

India along with other countries has signed the declaration on the 2030 Agenda for Sustainable Development, comprising of seventeen Sustainable Development Goals (SDGs) at the Sustainable Development Summit of the United Nations in September 2015. SDGs are comprehensive and focus on five Ps – people, planet, prosperity, peace and partnership.

On its current trajectory, India has already set for itself more ambitious targets for implementation of SDGs in several areas of economic progress, inclusion and sustainability.

The role of State governments is central to implementation of these programmes as well as in designing convergence with the SDGs in order to effectively influence all social and economic parameters to achieve the SDGs. Keeping this perspective in view, NITI Aayog has been in the forefront on articulation of India's approach to implement SDGs. In this context, RIS, jointly with NITI Aayog, UN Office, New Delhi; and State Governments has been organising a series of Consultation Meetings to evolve a cohesive policy framework for effective implementation of the SDG agenda. Earlier the Institute has also provided inputs to the Ministry of External Affairs in this regard.

As part of this major work programme on SDGs, RIS has also come out with a set of 19 papers dealing with various aspects of sustainable development goals. These papers have been prepared in collaboration with prominent experts from respective fields. Apart from 17 papers on each goal there are two papers covering the cross cuttings themes of technology and finance. The paper on technology has tried to explore operationalisation of Technology Facilitation Mechanism, technology and innovation capacity-building mechanisms and how to enhance the use of enabling technologies, in particular information and communications technology because these questions need to be addressed. It is also pertinent to underline here that RIS in collaboration with the National Institute of Advanced Studies and Department of Science and Technology, has also been working on the issue of TFM.

Further, financial inclusion is extremely important preposition, particularly for developing countries, which are facing huge inequalities. Recent studies on the rising cost of financial services for poor people across some of the developing economies are extremely worrying.

We strongly believe that the papers presented in this Volume would be found useful by all those who are working for successful implementation of SDGs agenda, particularly from the point of view of India.

Sachin Chaturvedi

1
End Poverty in All Its Forms Everywhere

Introduction

United Nations adopted the Millennium Declaration comprising the Millenium Development Goals (MDGs) as an outcome of deliberations in the United Nations Millennium Summit on 8 September 2000. It gave a new vision to the global efforts on development over the next 15 years. The Report of the United Nations Conference on Sustainable Development held in Rio-de-Janeiro, Brazil in June 2012 (also known as Rio+20) called "The Future We Want" paved the way for formal consultations on post-2015 development agenda in the form of Sustainable Development Goals (SDGs) based on three dimensions of development, namely, economic, social and environmental. SDGs are viewed as extensions of MDGs with sustainability parameter added to each MDG to be implemented in the post-2015 era along with a set of all new goals which were ignored in the MDGs.

The SDGs are a set of 17 specific goals offering special focus on important areas related to sustainable development that require urgent and extensive attention at present and in the near future. The SDG framework undertakes to provide systematic solutions to the obstacles identified in case of the MDGs like inequality, sustainability, institutional resourcefulness, implementation efficacy, environmental deterioration, etc., (UN 2014a). In this context, this paper attempts to explore the strengths and weaknesses of one specific MDG, namely, MDG 1 related to poverty eradication in context of India. Further the paper endeavours to identify the remaining gaps in fulfilling targets under MDG 1 with implications for the corresponding SDG 1, i.e., "End poverty in all its forms everywhere". This paper also supplements the evaluation of MDG 1 against the implementation framework of SDG 1 to be adopted by India in fulfilling this goal.

In order to set the background for SDG 1 for the next 15 years, we must evaluate the impact of MDG 1 in India. Second section presents a brief overview of targets of MDG 1 in the context of poverty. Third section provides evidence of achievements of MDG 1 targets and highlights the best practices and areas where the development programmes went beyond specified targets under the MDG 1. Fourth section briefly summarises the remaining gaps in fulfilling targets under the MDG 1. This section also highlights the estimated resource needs, scope of enhanced technology intervention, and impact evaluation with special attention to gender and youth issues. Fifth section describes the philosophy and concept of SDG 1 and its targets in detail, highlighting the scope and prospects with reference to achievements and failures of specific targets of MDG 1. Section six discusses in detail the implementation framework to be adopted by India in fulfilling the SDG 1 focussing on various parameters of implementation including its financing, technical architecture for its monitoring and evidences and lessons learnt from best-practices in the rest of the world.

Outline of MDG 1

Out of the eight MDGs adopted by the United Nations in 2000 to be achieved globally by the end of year 2015, the first Goal was to "Eradicate Extreme Hunger and Poverty". This goal was considered the most significant out of all and a precondition to achieve the rest of the seven MDGs. The overview of MDG 1 is given below.

MDG 1 was based on three specific targets:

Target 1.A: ***Reduce by half the proportion of people living on less than $1 a day.***

The above target was captured by the following three indicators:

- Poverty Head Count Ratio (PHCR): Extreme Poverty Rate.[1]
- Poverty Gap Ratio.[2]
- Share of poorest quintile in national consumption.[3]

Target 1.B and 1.C are associated with abating unemployment and combating extreme hunger levels globally.

Target 1.B: ***Achieve full and productive employment and decent work for all, including women and young people.***

This target had been captured by following four indicators:

- Growth rate of GDP per person employed.
- Employment to population ratio.
- Proportion of employed people living below $1 (PPP) per day.
- Proportion of own-account and contributing family workers in total employment.

Target 1.C: ***Reduce by half the proportion of people who suffer from hunger.***

This target was based on two indicators, namely:

- Prevalence of underweight children under five years of age.
- Proportion of population below minimum level of dietary energy consumption.

As indicated, MDG 1 consisted of three different but interconnected targets of abating poverty, reducing mounting levels of unemployment and combating hunger. However, scope of this paper is mainly restricted to the first target of MDG 1, i.e., Target 1.A related to poverty alleviation in India.

Achievements under MDG 1 targets in India

This section briefly discusses the achievements of MDG 1 in context of Poverty Eradication in India on the basis of various indicators during the 25 year period ranging from year 1990 to 2015. Laid on the objectives of MDG 1, the SDG 1 intends to end poverty and deprivation in all its forms from everywhere by implementing development policies based on the three dimensions of development.

While discussing India's achievements in MDGs, it can be said that India has made significant advances in securing the MDGs. India achieved the targets of MDG 1 way before 2015, but the outcome is unevenly distributed.

To assess Target 1 of MDG 1, the first indicator is Poverty Head Count Ratio (PHCR) which refers to proportion of population below the national poverty line. In the year 1990, the total number of people below poverty line in India was 403.1 million which reduced to 269.3 million in 2011-12 which indicates that about 134 million people in India were elevated above the poverty line during this period. If we look at the figures for urban areas, the drop in number of people below poverty line has been from 74.5 million to 52.8 million which indicates that nearly 22 million people in urban areas were pushed above poverty line during this period. However, the data for rural areas of India show even far reaching outcomes according to which number of people went down from 328.6 million in 1990s to 216.5 in 2011-12.

Target 1 of MDG 1 expected to reduce the proportion of population below poverty line to half of its 1990 level. According to the figures in 1990, the estimated PHCR for India was 47.8 per cent which was supposed to be reduced to at least 23.9 per cent by 2015. However, it declined to 21.9 per cent in 2011-12, which illustrates that India already attained first indicator of Target 1.A – three years ahead of its stipulated time-period. In 1990, the PHCR estimates for Urban and Rural areas were 30.47 per cent and 52.6 per cent, respectively, which were to be reduced at least to 15.2 per cent and 26.3 per cent by the end of year 2015. The data depicts that during the year 2011-12, the PHCR for urban area was estimated to be 13.7 per cent and for rural area it was 25.7 per cent, which again shows that both urban and rural areas achieved this target way before the stipulated time.

Second indicator for achieving Target 1.A of MDG 1 was the Poverty Gap Ratio (PGR) which exhibits the depth of poverty by measuring the gap between mean consumption of poor below poverty line and that corresponding to the poverty line. The data demonstrates significant achievements by India on this indicator. The PGR for all India has been reduced substantially, estimated from monthly per

capita consumption expenditure data based on Mixed Reference period (MRP).[4] The subsequent decline in urban PGR was from 9.62 in 2004-05 to 5.05 in 2011-12 while rural PGR declined from 6.08 in 2004-05 to 2.7 in 2011-12. This reflects that the poverty gap has been narrowed in both urban and rural areas during this period.

Government of India has implemented many programmes to bring overall improvement in the quality of life in rural areas through employment generation, development of rural infrastructure and provision of other basic amenities. At present, the Ministry of Rural Development, Government of India, is implementing Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), National Rural Livelihoods Mission (NRLM), Pradhan Mantri Gram Sadak Yojana (PMGSY), Indira Awaas Yojana (IAY) and National Social Assistance Programme (NSAP) in rural areas of the country, through State Governments.

Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) which came into effect on 2 February 2006 could be considered as one of the best practices of the Government of India to reduce poverty. MGNREGA is a centrally sponsored scheme which legally assures minimum 100 days of employment to any adult in rural area, who is seeking unskilled employment. According to the Ministry of Rural Development, MGNREGA can be described as unique in its scale and delivery architecture, and has become an effective instrument of inclusive growth, women empowerment, livelihood security and regeneration of natural resource base over the years. From 2008, every year around 5 crore households and 9 crore rural poor have been participating in the programme. Till August 2015, total number of job card holders were 12.35 crore with total number of workers as 27.28 crore.

Besides all the improvements that MGNREGA has made in national poverty figures, its performance in recent years points towards some alarming facts. The data depicts that disposal of funds available for MGNREGA decreased after the year 2011-12 despite better utiilisation of available funds for MGNREGA. According to official data produced by the Ministry of Rural Development, the participation rate of MGNREGA declined during the recent years from 30 per cent in 2011-12 to 27.8 per cent in 2013-14. The number of households gaining employment through MGNREGA fell from 5.26 crore in 2009-10 to 4.79 crore in the year 2013-14. The guidelines of MGNREGA instruct States to take special care of vulnerable groups like scheduled castes (SC), scheduled tribes (ST), women, disable, single women and other minority groups, but the data suggests that the benefits accruing to these vulnerable groups reduced significantly during the last few years. The employment days provided to SCs and STs together fell from 149.19 crore in 2009-10 to 88.02 crore man-days in 2013-14, suggesting a sharp decline of 64 per cent. Despite all these indications of drowning performance of MGNREGA in recent years, MGNREGA has played a vital role in reducing poverty in India by 32 per cent and prevented 14 million people from falling into the poverty trap during 2004-05 to 2011-12 (Desai, *et al.,* 2015).

It is also important to assess the success of implementation mechanisms of government schemes. An example of best practices on MDG 1 may be found in the Indian state of Orissa, where there is a mobile based monitoring system named Tracking Entitlements for Rural Communities (TERComs) to track the efficiency of social protection mechanism and delivery of entitlements to poor people in the rural areas. Under this scheme, village beneficiaries send their acknowledgements of receipts of entitlements under three main social protection schemes to the central server with the help of mobile phone application. This has led to real time monitoring of government funds utilised for social security of the poor. The same monitoring system is used at the district level in the state for monitoring the closing stock of Targeted Public Distribution System so as to estimate the stock entitlements not claimed by any of the beneficiaries every day. This model of monitoring could also be used in other states of India as well (UN 2010a,b).

Remaining Gaps in Fulfilling MDG 1 targets in India

This section elucidates the remaining gaps or hidden failures of MDG 1 Targets in India. Of all the failures of MDG 1, the third indicator of Target 1.A depicting the share of poorest quintile (20 per cent population) in total national monthly consumption portrays very

disappointing outcome. The data pertaining to this indicator shows that the overall share of poorest 20 per cent of population in total national monthly consumption was never above 10 per cent during the entire period ranging from 1993-2012 and instead of increasing, this share has declined over the years for both rural and urban areas despite some fluctuations during this period. The share of poorest quintile in national consumption is lower in urban areas as compared to rural areas. The figures demonstrate that according to URP (Uniform Reference Period)[5] method, the share of urban poorest quintile in national monthly consumption declined from 8 per cent in 1993-94 to 7 per cent in 2011-12, whereas the share of rural poorest quintile decreased from 9.6 per cent in 1993-94 to 9.1 per cent in 2011-12.

Despite phenomenal progress in terms of PHCR for all India level as well as for both rural and urban areas, the rural-urban gap still persists in PHCR. Though, rural-urban gap in PHCR at national level has declined significantly from 18 per cent in 1993-94 to 12 per cent in 2011-12, at state level it is still very high. The state-wise gap in PHCR of rural and urban areas is not only high but also depicts uneven picture across states. States like Mizoram exhibited a gap of 29 per cent while many other states such as Odisha, Arunachal Pradesh, Madhya Pradesh, Assam, Jharkhand and Chhattisgarh had gaps of more than the national average of 12 per cent in the year 2011-12.

The overall performance in India in PHCR is quite satisfactory but the state-wise figures of PHCR for India in the year 2011-12 are much skewed and not satisfactory. For instance, states like Goa and Kerala significantly reduced their PHCR levels in the year 2011-12 to 5.09 per cent and 7.05 per cent, respectively, which is nearly one-fourth and one fifth of the PHCR of 1990 for Goa and Kerala, respectively. Whereas other states like Chhattisgarh had very high PHCR in 2011-12 at 39.93 per cent followed by Jharkhand and Manipur at 36.96 per cent and 36.89 per cent, respectively, despite enormous reduction owing to very high PHCR in the base year, i.e. 1990. India as a whole may have achieved the target of MDG 1 related to halving the PHCR by the end of year 2015, but many Indian states like Assam, Bihar, Jharkhand, Chhattisgarh, Nagaland, Mizoram, Odisha, Madhya Pradesh and Uttar Pradesh missed their MDG targets partly because of high base year values of PHCR in these states (Refer Annex 1).

The achievement of both urban and rural areas was notable in case of PGR (Poverty Gap Ratio), but the corresponding figures of various states of India are not as impressive. On one hand, some states like Goa, Sikkim, Himachal Pradesh, Punjab and Uttarakhand performed better than the national average while on the other hand, a few states like UP, MP, Chhattisgarh, Bihar, Odisha, Jharkhand, Manipur, Arunachal Pradesh and Assam reported considerably higher PGR even in 2011-12. Some states even registered rise in incidence of poverty as per PGR in both rural and urban areas, like Manipur, Mizoram, Nagaland, Meghalaya and Arunachal Pradesh.

Surprisingly, the states which depicted poor performance in both PHCR and PGR have illustrated better performance in third indicator of Target 1A, i.e., share of poorest quintile in total consumption as compared to other states. These states are Sikkim, Manipur, Meghalaya and Mizoram for both rural and urban areas. The union territories of Chandigarh and Daman & Diu also performed well. Further, the state level disaggregation of poverty data in India reveals that the most populous states of India like Bihar, Madhya Pradesh, Uttar Pradesh, Odisha and Maharashtra were likely to miss their targets of MDG 1.

Philosophy and Concept of Sustainable Development Goals and Targets

SDGs are expected to supplement the positive outcomes of the MDGs. The idea behind up-gradation of MDG 1 to SDG 1 lies in the evolution of various approaches to measure poverty. The most ancient approach to poverty was the “Subsistence Approach” and the new concept of “Basic-needs Approach” came later, which along with food requirement also included aspects of non-monetary elements required for human subsistence. The concept of poverty was further broadened when Amartya Sen gave the concept of “Entitlements or Capabilities Approach” which proposed that “the income-centred view of poverty, based on specifying an interpersonally invariant ‘poverty line’ income, may be very misleading in the identification and evaluation of poverty. Since income is not desired for its own sake, any income-based

notion of poverty must refer – directly or indirectly – to those basic ends which are promoted by income as means" (Sen, 1993). There are also discussions on the concepts of "Human Poverty" and on more specific versions like "Gender-based Poverty" in academic and policy discourses.

The philosophy behind the inception of SDG 1 is to extend the MDG 1 targets based on Minimum Needs Approach and Basic Needs Approach of poverty to Capabilities Approach or Entitlements Approach and Gender-based Poverty Approach. The basic objective is to inculcate inter-generational entitlements and reduce intra-household disparities. On methodological aspect, SDGs are much wider in concept than MDGs as SDGs are based on holistic approach of poverty.

Unlike MDG 1, SDG 1 aims to end poverty from everywhere in all its forms which includes economic, social, gender-based and all other forms of deprivation in income, education, nutrition, health, access to water and sanitation, and vulnerability to economic shocks. This is known as Multi-dimensional Approach of poverty which guided the Targets of SDG 1.

Implementation Framework to be adopted by India for SDG 1

The remaining gaps in fulfilling the targets of MDG 1 illustrate that positive outcomes of MDG 1 could have been better in India if implementation framework adopted by India had been more comprehensive. This section elaborates the normative framework of implementation of SDGs to be adopted by India in order to assure targeted outcomes. The implementation framework focuses on two major dimensions as discussed below.

Financing of SDG 1 in India

To attain the proposed targets of SDG 1, it is necessary to optimally utilise each rupee of development expenditure. The largest proportion of development expenditure incurred at the national level comes from public resources (UN, 2014). However, being part of a welfare state, corporate sector must share responsibility of development along with the public sector. In fact, a healthy partnership between public and private resources may prove fruitful in ensuring positive development pay-offs (UNDESA, 2013). It requires worldwide change of perspectives, techniques and liabilities to reflect and reconstruct the new picture of a developing nation. However, the State has to be highly vigilant for corporate sector investments in development schemes. With the twin agenda of overcoming poverty and ensuring sustainable development on the basis of economic, social and environmental dimensions, the requirement of financial resources to achieve SDG 1 will definitely exceed the present development budget (World Bank and IMF, 2015).

Besides mandating private sector to invest in development financing through the Corporate Social Responsibility (CSR) Act[6], public investment should be planned in such a way so as to catalyse and leverage the funds flow from private sector and other domestic sources. Private investments are always driven by risk-reward considerations. Government should make special efforts in making development financing more profitable for private sector by incentivising development expenditure of corporate houses through efficient policies based on market solutions. Capital market investments that are targeted towards fostering activities under CSR are often known as 'socially responsible investments' (Sjöström and Welford, 2009). As compared to the developed economies of the world like Japan, UK and Australia, the volume of Socially Responsible Investment (SRI) is much less in Asia (ASrIA, 2008). Australian ethical funds have proved to be quite effective in generating SRI (Bauer *et al.*, 2006) and Asia can also learn from the experiences of U.K. in context of SRI (Solomon *et al.*, 2004). A few measures for facilitating or incentivising SRI in India can be implemented following these experiences of other economies. Firstly, the role of non-governmental organisations (NGOs) working for environmental, human rights and labour standards could be quite significant in forming coalitions with the shareholders in annual general meetings to influence corporate behaviour in favour of SRI (Waygood and Wehrmeyer, 2003). Also, these NGO's can have a dialogue with the management of corporate units to encourage them to invest in development financing. Secondly, corporate governance can also spur growth in SRI which elucidates the duties and responsibilities of corporate units, management as well as shareholders (Eurosif,

2004). Thirdly, pension-funds could be stimulated to invest with a perspective of SRI owing to their long-run nature and concern regarding the welfare of the nation (Clark and Hebb, 2004). In countries like USA and UK, huge investment in pension-funds are incurred.

Improved coordination between public sector, private sector, community organisations and civil society organisations in catering to financial and non-financial needs at the regional and sub-national levels builds effective ways to generate and utilise development finance for better opportunities.

The government agencies like NITI Aayog should provide technical assistance to states on mobilising financial resources on their own from domestic and international sources by innovations and capacity building. It is expected that the synthesis of financial support and technical assistance can lead to tremendous strengthening of development policies. In India the strategic use of development finance at the national level should be targeted towards low-income, highly vulnerable, poorly performing states with limited fiscal capacities like Bihar, Jharkhand, Chhattisgarh, Madhya Pradesh and Uttar Pradesh. State GDP could play a vital role in better implementation of SDG 1 across various regions as the states are equipped with better knowledge about opportunities and challenges at the local level. Greater fiscal autonomy should be provided to states. Development expenditure should be targeted more towards social security of young and the elderly and also of women as they comprise the most vulnerable class at the intra-household level which constitutes the depth of poverty.

Technical Architecture for Monitoring SDGs

Monitoring of SDGs is a very vital issue for their implementation. However, there could be no single approach which can monitor the development programmes in an optimum way. The implementation of SDG 1 requires amalgamation of a number of measures to be taken which could improve the technical architecture of SDGs and make them more target-oriented.

The biggest issue with the monitoring of development programmes is the performance measurement. First of all, objective parameters should be set for the evaluation of performance under SDG 1 (UNDP, 2015). Since, SDG 1 talks about removing poverty in all its forms from everywhere, it requires introspection of all forms of poverty prevalent in various countries. Human Poverty Index developed by the United Nations to complement Human Development Index could be referred for this purpose or country specific indices could be developed keeping in mind the country specific forms of poverty. This must include poverty in the form of deprivation in income or opportunities, education, access to natural resources, or inequality on the basis of gender, age, caste, creed, and other dimensions. Also, specific indices should be developed focussing on vulnerable sections of society like disabled population or transgenders to bring them to the mainstream and measure their level of poverty and its improvement over the years. Bhutan's Gross National Happiness Index (GNHI), Gender-related Development Index (GDI), Gender Empowerment Measure (GEM), Global Peace Index (GPI), OECD's Better Life Index, Genuine Progress Indicator, Index of Sustainable Economic Welfare (ISEW) are few such indices that capture poverty in its different forms. Secondly, the measurement of performance should be regular and at fixed intervals. Thirdly, evaluation agencies should be independent and autonomous of the implementing agencies in order to maintain the integrity of the measures. Fourthly, above mentioned objective approaches should be designed for measurement and only one specific approach should be used for measurement of one parameter. Lastly, regular publication of these measures should be brought out for various interest groups and the public.

The second issue with the implementation of such development programmes is decentralisation of planning, and design of mechanisms to be used for implementation of schemes. There should be greater decentralisation of planning and authority for developmental policy making. The success of decentralisation depends upon transparency and recognition of people's rights.[7] The role of local people and communities should be well-recognised and their support in implementing these policies should be encouraged (UNDG, 2014). Community based participation is necessary to ensure development at regional levels, with due recognition of challenges and obstacles in implementing pro-equity policies, many

Lessons from Best Practices and South-South Cooperation

South-South Cooperation (SSC) has become the expression of collaboration and partnership among countries from the South, interested in sharing, learning, and exploring their complementary strengths to go beyond their traditional role as aid recipients. SSC is allowing the emergence of a paradigm where "Horizontal Partnerships", based on equity, trust, mutual benefit and long-term relations, become an alternative way to do development cooperation.

Philippines have initiated citizen's participatory monitoring of local development projects for increasing transparency and accountability of implementing agencies. Specific lessons from Bangladesh regarding microfinance and employment generation from South-East Asian countries could be of vital use for India to solve its own problem of poverty.

The strategy adopted by Bangladesh is capacity building of poor and women, especially those belonging to the lagging regions of the country through a well planned education and training programme. The idea is to narrow down the skill gaps in labor force with special focus on target groups. Bangladesh has also successfully implemented a National Disability Action Plan involving all related ministries in collaboration with various NGOs to provide skill training, stipends, interest-free micro-credit and education facilities to the disabled population.

Nepal is a very unique country which redesigned its own constitution based on the needs and priorities of all the excluded segments of the society to remove inequality and disparity of socioeconomic nature. The Micro-Initiative Fund (MIF) in Bhutan was formulated to solve the problem of rural credit in agriculture sector and small-business by formal financial sector through Bhutan Development Bank, through Tarayana Foundation which is a microfinance institution and has various donor-assisted projects.

Source: Author's compilation from various sources including OCED Report "Unlocking the Potential of South-South Cooperation Policy Recommendations from the Task Team on South South Cooperation", Report of UN High level Plenary Meeting on MDGs (September 2010) and Best Practices in Poverty Alleviation and SDGs in South Asia: A Compendium, 2014.

of which themselves stem from inequities.[8] The vast differences in the infrastructure, resources and scale of development across various states and regions require state-specific or rather region-specific plans and policies which again demand greater autonomy at lower level or decentralisation of planning.

In order to evaluate the working of SDGs in India, emphasis should be laid on introducing an autonomous organisation of evaluation for various schemes and the role played by the government as well as private sector in development partnerships. Regular audits and verification of claims by private business groups which receive various grants and rebates of different kinds from the government should be conducted. An evaluation agency should comprise members from NITI Aayog representing government, civil society members, and members from local communities.

Since SDG 1 has laid down greater emphasis on removing poverty of all kinds from everywhere, it becomes essential to remove intra-household disparities among male and female, and young and old family members regarding poverty. For this, it is essential that gender-specific and age-specific intra-household poverty data should be collected and such database should be used efficiently for policy making. In India, presently there is no such measure of poverty or any such database, but in order to end poverty in all its forms it is necessary to make such database by inventing relevant methodology.

In employment, there is very narrow diversity based on gender, age, religion, caste, creed and culture which leads to exclusion of a large group of people from all the opportunities available. Such excluded groups of people always remain trapped in vicious circle of

poverty. A solution to this problem could be obtained by developing a diversity index of employment. The government should support public and private sector units based on such indices.

India is a welfare state and it is the primary responsibility of the state to provide basic amenities to all its citizens of all ages, gender, caste, creed and cultural background. To do this, poverty should be removed from its breadth and depth for which affirmative budgetary action is required.

Endnotes

1 Poverty Head Count Ratio means proportion of population below the national poverty line.

2 Poverty Gap Ratio at national poverty lines is the mean shortfall from the poverty lines (counting the non-poor as having zero shortfalls) as a percentage of the poverty lines. This measure reflects the depth of poverty as well as its incidence.

3 Share of poorest quintile means share of poorest 20 per cent population in total national monthly consumption

4 Mixed Reference Period for calculating Poverty in India was introduced by Suresh Tendulkar according to which "Reference Period" for five non-food items viz., clothing, footwear, education, durable goods and institutional medical expenses is one year and for other items is 30 days just before the survey.

5 Uniform Reference Period for calculating Poverty takes 30 days Reference Period for all food and non-food items.

6 In case of CSR, policy makers must be alert as this mandate could be of limited use in a scenario where the amounts spent under corporate social responsibility are much less than the tax concessions given to corporate. So, the government may opt for giving tax benefits to these corporate units proportional to the CSR investments they make so that the social expenditures of the state are not hampered by this.

7 For instance, right to information (RTI) is harnessed as a tool for promoting participatory development, strengthening democratic governance and facilitating effective delivery of socio-economic services. In the knowledge society, in which we live today, acquisition of information and new knowledge and its application have intense and pervasive impact on processes of taking informed decisions, resulting in overall productivity gains (Ansari, 2008).

8 Power relations can cause and sustain inequity. Tackling harmful power relations takes time, and the empowerment of disadvantaged people must be combined with improving accountability mechanisms and reforming democratic institutions. It is important to build a vibrant civil society and an independent media. Addressing unhelpful attitudes and beliefs can also help foster social cohesion and build a pro-equity social contract (Jones, 2009).

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Annex 1

Sl. No	State/UTs	1990 est	1993-94	2004-05	2011-12	Likely Achievement in 2015	Target 2015
1	Andhra Pradesh	49.74	44.60	29.90	9.20	8.27	24.87
2	Arunachal Pradesh	63.51	54.50	31.10	34.67	27.72	31.76
3	Assam	57.92	51.80	34.40	31.98	27.34	28.96
4	Bihar	62.28	60.50	54.40	33.74	33.03	31.14
5	Chhattisgarh	51.32	50.90	49.40	39.93	39.82	25.66
6	Delhi	16.49	15.70	13.10	9.91	9.34	8.25
7	Goa	19.78	20.80	25.00	5.09	5.09	9.89
8	Gujarat	39.62	37.80	31.80	16.63	15.98	19.81
9	Haryana	40.02	35.90	24.10	11.16	9.87	20.01
10	Himachal Pradesh	38.72	34.60	22.90	8.06	7.17	19.36
11	Jammu & Kashmir	31.74	26.30	13.20	10.35	7.99	15.87
12	Jharkhand	65.74	60.70	45.30	36.96	33.25	32.87
13	Karnataka	55.11	49.50	33.40	20.91	18.29	27.55
14	Kerala	35.51	31.30	19.70	7.05	6.15	17.76
15	Madhya Pradesh	43.57	44.60	48.60	31.65	31.65	21.78
16	Maharashtra	50.85	47.80	38.10	17.35	16.42	25.43
17	Manipur	75.40	65.10	38.00	36.89	29.93	37.70
18	Meghalaya	43.57	35.20	16.10	11.87	8.86	21.79
19	Mizoram	10.99	11.80	15.30	20.40	20.40	5.50
20	Nagaland	25.50	20.40	9.00	18.88	13.29	12.75
21	Orissa	59.63	59.10	57.20	32.59	32.96	29.81
22	Pondicherry	38.27	30.90	14.10	9.69	7.25	19.14
23	Punjab	22.83	22.40	20.90	8.26	8.36	11.41
24	Rajasthan	39.44	38.30	34.40	14.71	14.62	19.72
25	Sikkim	31.99	31.80	31.10	8.19	8.59	16.00
26	Tamil Nadu	50.20	44.60	28.90	11.28	9.91	25.10
27	Tripura	31.07	32.90	40.60	14.05	15.96	15.53
28	Uttar Pradesh	50.67	48.40	40.90	11.26	27.94	25.34
29	Uttarakhand	31.81	32.00	32.70	29.43	11.88	15.91
30	West Bengal	40.92	39.40	34.30	19.98	19.37	20.46
	India	**47.80**	**45.30**	**37.20**	**21.90**	**20.74**	**23.90**

Source: Planning Commission (Now renamed as NITI Aayog)

Goal 1: End poverty in all its forms everywhere: Targets and Indicators	
1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day	1.1.1 Proportion of the population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)
1.2 By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions	1.2.1 Proportion of population living below the national poverty line, by sex and age
	1.2.2 Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions
1.3 Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable	1.3.1 Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable
1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance	1.4.1 Proportion of population living in households with access to basic services
	1.4.2 Proportion of total adult population with secure tenure rights to land, with legally recognized documentation and who perceive their rights to land as secure, by sex and by type of tenure
1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters	1.5.1 Number of deaths, missing persons and persons affected by disaster per 100,000 people[a]
	1.5.2 Direct disaster economic loss in relation to global gross domestic product (GDP)[a]
	1.5.3 Number of countries with national and local disaster risk reduction strategies[a]
1.a Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement programmes and policies to end poverty in all its dimensions	1.a.1 Proportion of resources allocated by the government directly to poverty reduction programmes
	1.a.2 Proportion of total government spending on essential services (education, health and social protection)
1.b Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions	1.b.1 Proportion of government recurrent and capital spending to sectors that disproportionately benefit women, the poor and vulnerable groups

Note: [a] An open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction established by the General Assembly (resolution 69/284) is developing a set of indicators to measure global progress in the implementation of the Sendai Framework. These indicators will eventually reflect the agreements on the Sendai Framework indicators.

2
Hunger and Food Security Concerns for India

Introduction

In 2015, the global community achieved a landmark by agreeing on a comprehensive development agenda under the rubric of Sustainable Development Goals (SDGs). The SDGs are a sequel to the Millennium Development Goals that dominated global development thinking throughout the first decade and half of this century. Compared to the MDGs, the SDGs are more elaborate. They are supposed to be goals for all countries rather than for poor countries alone. The SDGs evolved from an extensive consultation process at the United Nations involving member countries, civil society organisations, business community and other actors. The SDGs comprise 17 goals which in turn have been broken up into 169 targets. The progress towards these targets will be measured by indicators. As many targets are proposed to be measured by multiple indicators, the total numbers of indicators are greater than the number of targets. Presumably the indicators could be substituted depending on relevance and statistical capacity.

Global governance through the organs of United Nations and associated institutions is complex and often not well defined with respect to domestic sovereignty and domestic political processes. Global institutions that simply coordinate country policies (such as international postal unions) are not contentious. But when such institutions seek to impose a uniform architecture and a set of rules (such as in WTO), they need to be backed by explicit country commitment. These are contentious domestically and it is not surprising that consensus or simply give and take deals are hard to achieve. Disparities in interests stretch not only across countries but also within countries.

At first blush, SDGs seem hardly contentious. Indeed, who can possibly disagree with the outcomes embodied in the goals? It might then seem that SDGs reflect common aspirations and express the unity of human experience. But the need to articulate these goals and that too after extensive consultation, suggests: (a) that these goals were not all obvious and (b) that articulation is seen as a visible commitment of sorts by member countries that otherwise would remain buried. The commitments, however, carry no bite. The supremacy of country sovereignty means that countries are free to accord the degree of importance to the SDGs in their own development agenda. While there are no formal sanctions (unlike say in WTO), there is probably a hope that being held to a global yardstick would be sufficient motivation and failure to achieve it would risk shame to a proud nation.

But then the puzzle is why countries voluntarily submit to the risk of shame intrinsic in international comparisons. This is not an unlikely outcome. India's progress in reducing the prevalence of underweight children, reducing infant mortality or in schooling has been less than stellar even when compared to more impoverished countries. So why does India sign on to these goals? Surely, even the political leadership would concede the primacy of some of the SDGs (or MDGs) but it is not clear if the government would always wish to give it the same importance as the international community.

The truth is that international commitments (especially if they are soft) are somewhat disjointed from domestic politics and economic pressures.

This is true not just in India but probably in most countries. The Indian delegates to UN meetings where goals are decided have little leverage on domestic policies. A stand that such goals are in the domain of domestic policies alone would appear unnecessarily churlish since they impose no formal demands on country resources and nor do they impose constraints on country policies.

The well-meaning countries, the networked civil society organisations and the international bureaucracy that staffs the UN and related organisations that have promoted global development goals are not unaware of the tension within domestic processes. They are, however, counting that even with no formal commitment mechanisms (with penalties and rewards), global goals can mobilise collective consciousness and hasten the progress. Of course, countries that are dependent on donor resources could be elicited to be more responsive although even in these cases it is hard to achieve meaningful advance on the ground if the countries just go through the motions.

From this context, it is clear that assent to SDGs does not lay out a clear path for country development agendas to be consistent with global goals. In the past, MDGs were not a major consideration in India's economic policies and the future may not be very different with respect to SDGs in general. Of course, the extent to which SDGs overlap with domestic agenda, will impact reinforcement of policies in those spheres. From the point of view of India's development priorities, SDGs could, empower local domestic constituencies that seek to mobilise support for some of the global goals and thereby alter local political economy at the margin. In this paper, an attempt has been made to respond to SDG 1 and SDG 2. The first goal relates to the elimination of poverty and the second goal relates to ending hunger and other related outcomes of achieving food security, improved nutrition and promoting sustainable agriculture.

SDG 1 and SDG 2

SDG 1: End Poverty in all its forms everywhere

SDG 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

The annexure shows the first and second goals, the targets that comprise the goals and the indicators that have been proposed to measure the targets. Targets 1.1 and 1.2 relate to poverty outcome measures that are generally well known and for which the data base (household expenditure surveys) exists in many but not all countries. India's significant achievement in terms of poverty eradication is depicted in Figure 1. Figure 2 indicates overall achievement of MDG 1 target on poverty measured in terms of head count ratio.

Target 1.3, by comparison, is an explicit policy directive to achieve social protection mechanisms. However, the target is not quantified and the attributes of social protection are not defined either. Indian social policy does place emphasis on social protection mechanisms (Integrated Child Development Services, Public Distribution System, National Rural Employment Guarantee Act, Old Age Pensions, Indira Awas Yojana) although their efficiency has been vigorously debated.

Target 1.4 that seeks equal rights to economic resources and access to basic services would be more novel in the Indian context. The proposed indicators do not do a great job of clarifying this target – they manage to be both vague and modest. It is unlikely that this target can be quantified in a comprehensive manner. Target 1.5 that seeks resilience of the poor to climate and other shocks is a worthwhile goal and hopefully it would lead India to collect and estimate the impact of natural disasters. Resilience is a much used word in the development discourse these days; it is sometimes forgotten that resilience is best achieved by higher prosperity and growth. Targets 1a and 1b are about development assistance and sound policy frameworks read as statements of intent for global cooperation rather than targets for domestic policies.

Interestingly, the second goal under the SDGs concerning hunger may not follow directly from the previous goal on poverty in the Indian context. Some factual details on decline in poverty as well as average per capita calorie intake and an increase in the extent of calorie deprivation in recent years for India are as follows. For the country as a whole rural poverty declined from 45.61 per cent in 1983 to 28.30 percent and urban poverty declined from 42.15 per cent to 25.70 per cent between 1983 and 2004-05. During the intervening period, average calorie intake per capita declined from 2221 to 2047 and from 2089 to 2020 kcal in the rural and urban sectors, respectively. As regards calorie deprivation, its extent increased

from 69 to 85 per cent in rural India and from 60 to 65 per cent in urban India (Suryanarayana, 2013). This is also reflected in the fact that both statisticians and policymakers have been confronted with serious debates stemming from determining poverty levels based on minimum calorie intake (Box 1).

SDG Targets 2.1 and 2.2 continue the MDGs of ending hunger and malnutrition. These are the big targets in this section. The indicators for ending hunger focus on energy intake and food security while the proposed indicators for malnutrition measure stunting and obesity for children measuring the so-called double burden of under-nutrition and over-nutrition. India has a very high rate of incidence of diabetes and to the extent that the composition of food intake matters to it, the obesity measure will be increasingly relevant accordingly. At this point, however, the major concern is with under-nutrition and therefore, it may be important to supplement the stunting indicator with other measures of poor nutrition including under-weight children, low birth weights, particular deficiencies in micro-nutrients and the health of young women. The nutritional needs of adolescent girls, pregnant and lactating women comprise a separate Target 2.2 but do not yet find indicators. With some effort, surveys can be done on quality of dietary intake of women and this is a direction that should be pushed in India.

Highlighting the crucial importance of nutritional status of children, Indicator 4 under Target 2, in MDGs was identified as 'Prevalence of underweight children Under 5 years of age'. In India, data on this indicator for the reference age group are not available for all time points. The National Family Health Survey (NFHS) collected data on underweight children between 0-35 months and 0-47 months of age in 1992-93 (NFHS-1), between 0-35 months in 1998-99 (NFHS-2) and between 0-35 months as well as 0-59 months in 2005-06 (NFHS-3).Thus the survey results are comparable only for the age group 0-35 months in India and therefore, Target 2 is measured in terms of nutritional status of children below 3 years (Government of India MDG Report, 2015).

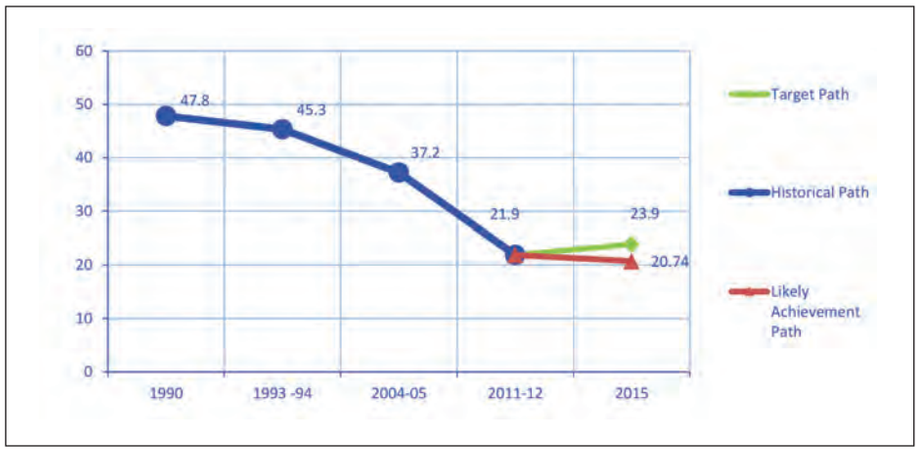
It is estimated that in 1990, 52 per cent of children below 3 years were underweight. In order to meet the target, the proportion of under-weight children should decrease to 26 per cent by 2015. The NFHS shows that, the proportion of under-weight children below 3 year declined from 43 per cent in 1998-99 to 40 per cent in 2005-06. At this rate of decline the proportion of underweight children below 3 years is expected to reduce to 33 per cent by 2015, which indicates India is falling short of the MDG target.

The report based on NFHS finds that, under-nutrition is substantially higher in rural areas than in urban areas. While in the urban areas the proportion of under-weight children below 3 years decreased from 34 per cent in 1998-99 to 31 per cent in 2005-6, the decrease was marginal in rural areas from 45 per cent to 44 per cent during the same time (see Table 1). In addition to underweight, stunting was also highly prevalent among children below three years of age. As per NFHS-3, even in urban areas, one in every 3 children is stunted, characterised by lack of appropriate

Figure 1: Number of People below Poverty Line (in million)

Source: Planning Commission (now renamed as NITI Aayog).

Figure 2: Trend in Poverty Head Count Ratio-All India



Source: Planning Commission (now renamed as NITI Aayog).

Box 1: Poverty Line and Calorie Intake – The Debate

The Indian poverty lines are based explicitly on estimates of the normative nutritional requirement of the average person in the rural and urban areas of the country separately. These national norms[1], which are 2,400 kilocalories/day and 2,100 kilocalories/day for rural and urban areas, respectively are not arbitrary figures, but have been derived from age-sex-occupation-specific nutritional norms by using the all-India demographic data from the 1971 Census. Therefore, it is more than likely that state-specific calorie norms derived from the state wise age-sex-occupation distributions would differ from the national norms even in the base year, but it would be within a fairly narrow range. Moreover, it is quite possible for the actual calorie consumption to deviate substantially from these base-year national norms as a result of variations in the age-sex-occupation structure of the population over time and across regions without necessarily violating the nutritional requirements.

The second criticism of the poverty line, from a nutritional point of view, is that a purely calorie-based measure of food adequacy is simply wrong. It is rightly asserted that the mere consumption of an adequate number of calories may not ensure sufficient intake of other nutrients, such as proteins, fats and micro-nutrients, which are just as essential for human health. It can further be argued that there is a distinction between gross calorie intake and net calorie absorption, and that the relationship between the two may change over time depending upon the incidence and severity of gastro-intestinal disorders. Thus, on the one hand, it is entirely possible that a person may be consuming the requisite number of calories, but she/he could still be seriously malnourished.

Source: Sen (2005).

height according to their age and in rural areas almost half of the children are stunted. NFHS-3 also reported that nutritional status of children is strongly related to maternal nutritional status. Under-nutrition is much more common for children of mothers whose body mass index is below 18.5 than for children whose mothers are not underweight. Also, under-nutrition decreases steadily with increase in the wealth index of the household. The state-wise disparity is shown in Table 2.

Targets 2.3 and beyond relate to agriculture and its sustainability. While productivity measures are routinely collected, disaggregating it for small farmers and for women farmers requires additional effort. In order to facilitate productivity growth, it is important to ensure that farmers receive lucrative prices for their produce. Issues related to price fall under two categories. First, for some commodities and in some regions, the government has arrangement for procurement at a preannounced Minimum Support Price (MSP). By design, the MSP is available only in regions where the government procures the commodities and only on commodities it chooses to procure. In other regions, even for commodities covered, not all farmers are able to sell their produce at the MSP. Second, the prevailing marketing

Table 1: Trends in Nutritional Status of Children below 3 years

	NFHS -2 (1998-99)			NFHS-3 (2005-06)		
	Urban	**Rural**	**Total**	**Urban**	**Rural**	**Total**
Children Stunted (Height for age) %	41.1	54.0	51.0	37.4	47.2	44.9
Children Wasted (Weight for height) %	16.3	20.7	19.7	19.0	24.1	22.9
Children Underweight (Weight for age)%	34.1	45.3	42.7	30.1	43.7	40.4

Source; NFHS -3 (2005-06) Volume 1

Table 2: Trends in Proportion of Underweight Children in States

States showing worsening of nutritional status of children (in terms of underweight) during 1998-99 to 2005-06			**States showing improvement of nutritional status of children (in terms of underweight) during 1998-99 to 2005-06**		
Percentage of underweight Children below 3 years			**Percentage of underweight Children below 3 years**		
	1998-99	**2005-06**		**1998-99**	**2005-06**
Arunachal Pradesh	21.9	29.7	Andhra Pradesh	34.2	29.8
Bihar	52.2	54.9	Chhattisgarh	53.2	47.8
Haryana	29.9	38.2	Delhi	29.9	24.9
Jharkhand	51.5	54.6	Himachal Pradesh	36.5	31.1
Madhya Pradesh	50.8	57.9	J&K	29.2	24.0
Nagaland	18.8	23.7	Karnataka	38.6	33.3
Sikkim	15.5	17.3	Maharashtra	44.8	32.7
Meghalaya	28.6	42.9	Mizoram	19.8	14.2
			Odisha	50.3	39.5
			Rajasthan	46.7	36.8
			Tamil Nadu	31.5	25.9
			Uttar Pradesh	48.1	41.6
			Uttarakhand	36.3	31.7
			West Bengal	45.3	37.6

Source: National Family Health Survey-2 (1998-99), National Family Health Survey-3, 2005-06.

arrangements under the conventional Agricultural Produce Market Committee (APMC) Acts in the states have meant that the farmer receives a small fraction of the price paid by the final consumer. Marketing arrangements under these acts have undermined the interests of the farmers and benefited the intermediaries (Chand, 2012; Gulati, 2013; NITI Aayog, 2015).

Target 2.4 about sustainability of food production systems would also be a goal for domestic policy makers. The notion of sustainability in the context of agricultural practices which is critically linked with the nature of inputs may not fall under one size fits all parameters. Hence, the proposed indicators seem to be partial and inadequate. The target focuses on resilient agricultural practices that are expected not only to increase productivity and production but also to maintain ecosystems and improve land and soil quality. Table 3 depicts the current status of area, production, yield and percentage area irrigated with food grains in different states of India. This should indicate the expanse of cultivable land in India and hence the gigantic needs in terms of sustainability practices, and resources and technology deepening. Uttar Pradesh accounts for the largest share by area as well as production by a wide margin. It accounts for almost one-fifth of the country's food grain production. While Punjab and Haryana have been traditionally seen as the

Table 3: Area, Production and Yield in Food Grain in 2013-14 and the Proportion of Area under Food Grains in 2011-12

State	Area (in Hectares)	Percentage of Total Area	Production (million tonne)	Percentage of Total Production	Yield (Kg per hectare)	Percentage of Area Irrigated (2011-12)
Uttar Pradesh	20.23	16.05	50.05	18.9	2474	76.1
Punjab	6.56	5.2	28.9	10.92	4409	98.7
Madhya Pradesh	14.94	11.85	24.24	9.15	1622	50.5
Andhra Pradesh	7.61	6.04	20.1	7.59	2641	62.5
Rajasthan	13.42	10.64	18.3	6.91	1364	27.7
West Bengal	6.24	4.95	17.05	6.44	2732	49.3
Haryana	4.4	3.49	16.97	6.41	3854	88.9
Maharashtra	11.62	9.22	13.92	5.26	1198	16.4
Bihar	6.67	5.29	13.15	4.97	1971	67.4
Karnataka	7.51	5.95	12.17	4.6	1622	28.2
Tamil Nadu	3.55	2.81	8.49	3.21	2396	63.5
Odisha	5.15	4.09	8.33	3.15	1617	29
Gujarat	4.29	3.4	8.21	3.1	1917	46.0
Chhattisgarh	4.95	3.93	7.58	2.86	1532	29.7
Assam	2.53	2.01	4.94	1.87	1952	4.6
Jharkhand	2.24	1.77	4.19	1.58	1874	7.0
Uttarakhand	0.89	0.71	1.78	0.67	2001	44.0
Others	3.26	2.59	6.38	2.41		
All India	126.04	100	264.77	100	2101	49.8

Source: "Raising Agricultural Productivity and Making Farming Remunerative for Farmers", NITI Aayog, 2015.

major contributors to food grain production, Madhya Pradesh, Andhra Pradesh, Rajasthan and West Bengal have emerged as significant producers in recent years.

Countries would also applaud Target 2.5 relating to genetic diversity; however, difficulties in collecting data on indicators may dissuade countries from embracing the target. Target 2a is a desire to increase investment in rural infrastructure, agricultural research, extension services, technology development and related activities. Like some of the other targets (such as 2.4), this one too defies quantification. The proposed indicator of measuring government expenditures on agriculture is useful but only up to a point. There is no natural benchmark of what level can be considered adequate.

Conclusion

SDGs 1 and 2 resonate strongly with the Indian development agenda: elimination of poverty and hunger continue to be our major goals despite progress towards these goals in the last 50 years. The data base for poverty indicators is robust and India also has some of the elements of a social protection network although the measurement of their coverage and their impacts is less assured. As regards hunger, India is justly proud of its success in food production. However, this has not automatically taken care of the problem of hunger because access to food also depends on incomes and prices. If India succeeds in the goal towards poverty reduction, it will also contribute substantially to the elimination of hunger.

Indian policy has, however, placed too much emphasis on hunger measured in terms of low dietary energy intake. Over the last two decades, we have come to understand that India faces a serious problem with nutrition. Too many of our children are shorter and weigh less than children in even other impoverished

countries in our region and elsewhere. This may partly be due to the young age of marriage of women and also their poor nutritional status. The policy has not evolved a robust response to this problem. The disappointing feature of official policy is that it has not worked out standard routine official data surveys that can capture, report and monitor the extent of the problem. This is the principal challenge today and if we can accomplish this, then it would take us a long way in meeting the SDGs as well.

Endnote

[1] Although, the figure on nutrition intake is different in NSSO Report 2011-12, the data shows that per capita calorie consumption rose to 2099 kilocalories per day in rural areas and 2058 kilocalories per day in urban areas. Both numbers are still below a Planning Commission benchmark of 2,400 kilocalories per day.

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Annex

Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture: Indicators and Targets	
2.1 By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round	2.1.1 Prevalence of undernourishment 2.1.2 Prevalence of moderate or severe food insecurity in the population, based on the Food Insecurity Experience Scale (FIES)
2.2 By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons	2.2.1 Prevalence of stunting (height for age <-2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age 2.2.2 Prevalence of malnutrition (weight for height >+2 or <-2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)
2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment	2.3.1 Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size 2.3.2 Average income of small-scale food producers, by sex and indigenous status
2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality	2.4.1 Proportion of agricultural area under productive and sustainable agriculture
2.5 By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed	2.5.1 Number of plant and animal genetic resources for food and agriculture secured in either medium or long-term conservation facilities 2.5.2 Proportion of local breeds classified as being at risk, not-at-risk or at unknown level of risk of extinction
2.a Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries	2.a.1 The agriculture orientation index for government expenditures 2.a.2 Total official flows (official development assistance plus other official flows) to the agriculture sector
2.b Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round	2.b.1 Producer Support Estimate 2.b.2 Agricultural export subsidies
2.c Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility	2.c.1 Indicator of food price anomalies

Goal 1: End poverty in all its forms everywhere: Targets and Indicators	
1.1 By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day	1.1.1 Proportion of the population below the international poverty line, by sex, age, employment status and geographical location (urban/rural)
1.2 By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions	1.2.1 Proportion of population living below the national poverty line, by sex and age
	1.2.2 Proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions
1.3 Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable	1.3.1 Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable
1.4 By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance	1.4.1 Proportion of population living in households with access to basic services
	1.4.2 Proportion of total adult population with secure tenure rights to land, with legally recognized documentation and who perceive their rights to land as secure, by sex and by type of tenure
1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters	1.5.1 Number of deaths, missing persons and persons affected by disaster per 100,000 people[a]
	1.5.2 Direct disaster economic loss in relation to global gross domestic product (GDP)[a]
	1.5.3 Number of countries with national and local disaster risk reduction strategies[a]
1.a Ensure significant mobilization of resources from a variety of sources, including through enhanced development cooperation, in order to provide adequate and predictable means for developing countries, in particular least developed countries, to implement programmes and policies to end poverty in all its dimensions	1.a.1 Proportion of resources allocated by the government directly to poverty reduction programmes
	1.a.2 Proportion of total government spending on essential services (education, health and social protection)
1.b Create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions	1.b.1 Proportion of government recurrent and capital spending to sectors that disproportionately benefit women, the poor and vulnerable groups

Note: [a] An open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction established by the General Assembly (resolution 69/284) is developing a set of indicators to measure global progress in the implementation of the Sendai Framework. These indicators will eventually reflect the agreements on the Sendai Framework indicators.

3
Health for All by 2030: An Indian Perspective

Introduction

In India, achievement of health for all is a constitutional obligation of the State. The Directive Principles of State Policy of the Constitution of India, which are fundamental in the governance of the country specifically provide for "improvement of public health'' as one of the primary duties of the State.[1] There are other Principles that set the various parameters for achieving health for all within the limitations of a newly independent country. Article 39 enjoins the State that it should secure for all its citizens, "men and women equally, have the right to have an adequate means of livelihood"[2], that "children are given opportunities and facilities to develop in a healthy manner"[3], and that it should "raise the level of nutrition and the standard of living".[4] The Directive Principles, though not enforceable in a court of law, unlike the case with the Fundamental Rights, are, nevertheless, "binding on the various organs of the State"[5] They along with the Fundamental Rights, constitute the "conscience" of the Constitution and, therefore, is of equal importance.[6] Over the years, through various judicial interpretations, the right to health acquired almost the same status of a Fundamental Right (see Box 1).

Despite the constitutional provisions and the case laws on the subject, India's progress towards, universal health care has been rather tardy. At the time of its Independence in 1947, the key indicators of public health were very low. Life expectancy was around 32 years in 1948[7], slightly improving to 36.7 in 1951.[8] Infant mortality rate (IMR) was 146 in 1951; crude death rate 25. There was wide spread presence of infectious diseases such as TB, leprosy, small pox, Malaria, etc.

Even in 2000, at the beginning of the current millennium, India's record in public health was not enviable. Life expectancy was 64.6; IMR 70 and crude death rate 8.7. However, it had some remarkable achievements such as eradication of small pox by 1981, reduction of malaria cases to 2.2 per million, leprosy cases 3.74 per 10,000. It had also eradicated guinea worm cases by 2000 and brought down polio cases to 265.[9]

In fact, most of the developing countries had this challenge of providing proper health care within national economic development plan, rather than be a sick populace nursing its own wounds. Post World War II, the concept of welfare state had many adherents in most countries, though the two economic models that predominated the second half of the twentieth century caused political cold war between the two blocs. In order to have concerted action among all countries in the fight against ill health and diseases, the World Health Organisation (WHO) was set up in 1948, since "the health of all people is fundamental to the attainment of peace and security", and "unequal development in different countries in the promotion of health and control of disease, especially communicable disease, is a common danger"[10], which cannot be tackled by states separately. Meanwhile, the Universal Declaration of Human Rights was also adopted by the United Nations (UN) in 1948, which clearly declared "every one has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services …"[11] as one of the common standard of achievement for all peoples and all nations.

Box 1: Expanding Scope of Right to Health

In *Consumer Education and Resource Centre v. Union of India (*AIR 1955 SC 636*),* the court held that right to health is an essential right for human existence and is, therefore, integral to right to life, guaranteed under Article 21 of the Constitution. In *Bandhua Mukti Morcha v. Union of India (*AIR 1984 SC 802), the court considered right to health as an important human right, which is essential for a life with dignity, thus making right to health also part of right to life. The concept got further expanded in *Paschin Bagga Khet Mazdoor Samiti v Government of West Bengal* (AIR 1996 SC 426), wherein it held that failure of a government hospital to provide a person timely medical care is denial of the right to life. The view that right to life includes right to health and all the adjutants therein got expanded more and more through various court pronouncements and, now the court routinely takes the obligation of the State to provide facilities for health care as a fundamental obligation of the State (See *Parmanand Katara v. Union of India*, 1989(4) SCC 286; *State of Punjab and Others v. Mohinder Singh*, AIR 1997 SC 1225; *Mahendra Pratap Singh v. State of Orissa*, AIR 1997 Ori 37; and *M.C Mehta Vs Union of India*, AIR 1987 SC 1086. All available at www.indiakanoon.org)

When diplomats met to form the United Nations Organisation (UNO) in 1945, one of the things they discussed was setting up a global health organisation and the result is the World Health Organisation (WHO). Its constitution came into force on 7 April 1948.[12] The WHO contributed significantly to the improvement of health in several developing and least developed countries (LDCs) with focussed programmes. It was also able to sensitise government functionaries to the need and importance of focussing on programmes for improving the health status of the people in every country.

From MDGs to SDGs

During the second half of the twentieth century, governments around the world started paying more attention than in the past to the goal of achieving health for all. New developments in the field of medical sciences such as new vaccines and new medicines for several diseases and the antibiotic revolution helped this process. There was a general realisation that more focussed attention with specific achievable targets is required to achieve universal health care. The world leaders, finally, signed in September 2000, a declaration committing themselves to fight, among others, diseases that were seriously affecting global public health. Out of the total eight Millennium Development Goals (MDGs), three are specifically about health, reflecting the concern of the global community. The goals are reduction of under five mortality by two-thirds and maternal mortality ratio (MMR) by three quarters, between 1990 and 2015, achievement of universal access to reproductive health, and halt and reverse the spread of HIV/AIDS, malaria and other diseases by 2015, and achievement of universal access to treatment for HIV/AIDS for all those who need, by 2010. It also had proposed the goal to increase health expenditure as a percentage of GDP from the then existing 0.9 per cent to 2 per cent by 2010.

By 2012, countries around the world realised that the achievements in MDGs, though good, were not sufficient and that it is necessary to carry them forward in a more sustainable way. This led to the drafting of the SDGs which were approved on 25 September 2015. Out of the 17 goals of SDGs, Goal No. 3 "Ensure healthy lives and promote well being for all at all ages" is specifically about health, but there are other SDGs which are indirectly about health. Ending hunger, achieving food security and improved nutrition in Goal No 2, ensuring availability and sustainable management of water and sanitation for all in Goal No. 6, and ensuring access to affordable, reliable, sustainable and modern energy for all in Goal No. 7 have great relevance for achieving the health for all goal. This can also be perceived from the targets under different goals, which directly or indirectly impact the health goal (see Box 2).

Health in India: Key Indicators

Though India's response towards international efforts on health stemmed from its constitutional obligations and developmental demands, as stated above, progress towards universal health has been rather slow. Even at the time of formulation of its 10th Five Year Plan (FYP) in 2002, India had a big health deficit as could be seen

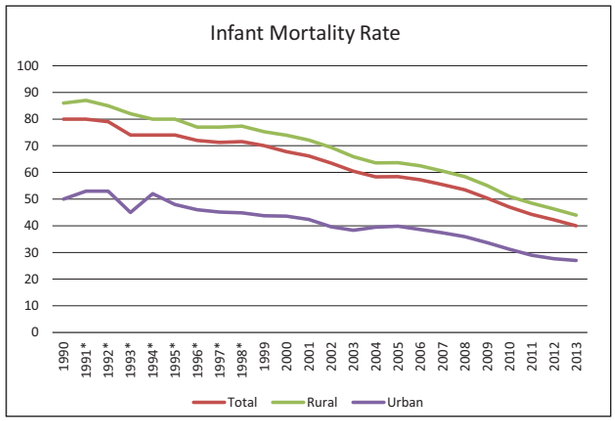
from its share in global health problems projected by the Planning Commission.[13] Even though its share in world population was 17 per cent only, it had a share of 23 per cent in child deaths, 26 per cent in childhood vaccine preventable deaths, 20 per cent in malarial deaths, 68 per cent in leprosy cases, and 30 per cent in tuberculosis cases. Even in the number of HIV infected persons, a disease of comparatively recent origin, it had a 10 per cent share. These obviously were not matters of pride. During the years succeeding the position has not altered much.[14]

An Assessment of India's MDG Efforts

The UN Development Group (UNDG) in 2003 provided a framework of 53 indicators for measuring the progress towards individual targets. Subsequently the Inter-Agency and Expert Group (IAEG) on MDGs drew up in 2008 a revised framework with more targets and indicators[15], but India never endorsed the revised one. However, it took various measures to achieve the targets as set in 2003. The fact that the MDG targets gelled with India's 11th FYP health indicators in areas like lowering maternal and infant mortality, malnutrition among children, anaemia among women and girls, fertility rate, and raising the child sex ratio contributed to this. At policy level, India came out with a new National Health Policy in 2002, which expounded the directions in which health programmes were to be targeted. Some of the goals set in this policy included eradication of Polio and Yaws by 2005, elimination of Leprosy by 2005, Kala-azar by 2010 and Lymphatic Filariasis by 2015. It also had achievement of zero level growth of HIV/AIDS by 2007, reduction of mortality on account of Tuberculosis (TB), Malaria and other vector and water borne diseases by 50 per cent by 2010, reduction of IMR to 30/1000 and MMR to 100/lakh by 2010.

Through implementation of the National Health Policy of 2002 and the efforts made by the country to achieve the MDG goals of reduction of child and maternal mortality rates, India has achieved some progress in certain selected indicators relating to mother and neo-natal care, which are basic to health care as captured in the graphs in Figures 1-5.[16]

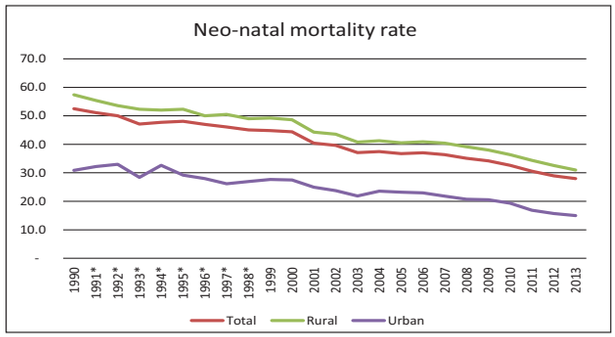
Figure 1: Infant Mortality Rate (IMR) (1990-2013)



Source: Compendium of India's Fertility and Mortality Indicators, 1971 - 2013

The IMR always has been showing a wide disparity between the rural and urban areas and it continued to be so during the selected period.

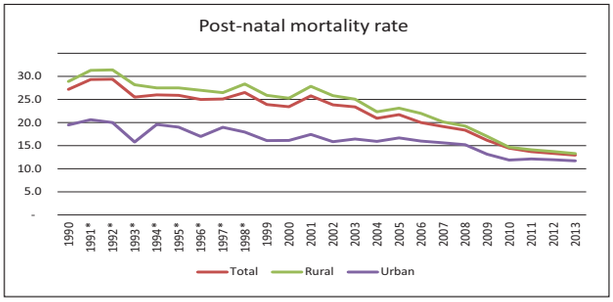
Figure 2: Neo-natal Mortality Rate (NNMR) (1990-2013)



Source: Compendium of India's Fertility and Mortality Indicators, 1971– 2013

In this paradigm also the rural-urban divide continued.

Figure 3: Post-natal Mortality Rate (1990-2013)



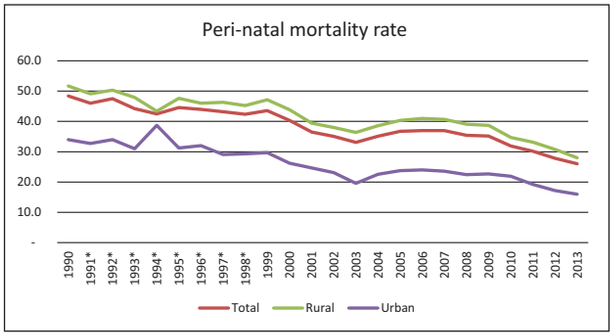
Source: Compendium of India's Fertility and Mortality Indicators, 1971 –2013.

Box 2: SDG Health related Targets

SDG 3 Targets	Other Linked Targets
3.1 By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births	2.1 By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round
3.2 By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births	2.2 By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons
3.3 By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases	5.6 Ensure universal access to sexual and reproductive health and reproductive rights as agreed ,in accordance with the Programme of Action of the International Conference on Population and Development and the Beijing Platform for Action and the outcome documents of their review conferences
3.4 By 2030, reduce by one-third premature mortality from non-communicable diseases through prevention and treatment, and promote mental health and well-being	6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all
3.5 Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol	6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations
3.6 By 2020, halve the number of global deaths and injuries from road traffic accidents	6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally
3.7 By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes	7.1 By 2030, ensure universal access to affordable, reliable and modern energy services
3.8 Achieve universal health coverage (UHC), including financial risk protection, access to quality essential health care services, and access to safe, effective, quality, and affordable essential medicines and vaccines for all	11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.
3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination	
3.a Strengthen the implementation of the World Health Organisation Framework Convention on Tobacco Control in all countries, as appropriate	
3.b. Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all	
3.c Substantially increase health financing and recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States	
3.d. Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks.	

In the case of post-natal mortality rate, there has been significant progress in reducing the disparity between the rural and urban areas.

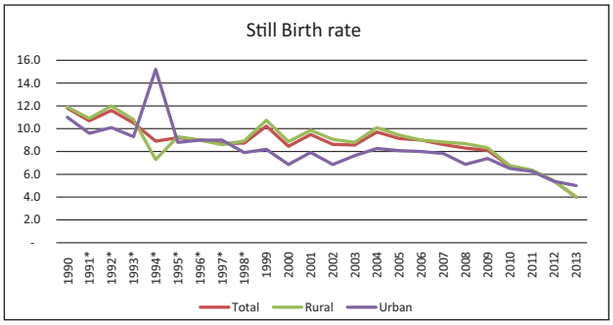
Figure 4: Peri-natal Mortality Rate (1990-2013)



Source: Compendium of India's Fertility and Mortality Indicators,1971– 2013.

In this case also the rural-urban divide continued without much diminishment.

Figure 5: Still Birth Rate (1990-2013)



Source: Compendium of India's Fertility and Mortality Indicators, 1971 -2013.

The decline of still birth rate has thrown up a result which shows the rural sector overtaking the urban sector in the matter of achievement having reduced from 11.9 per cent in 1990 to 4.0 per cent in 2013, overtaking urban sector.

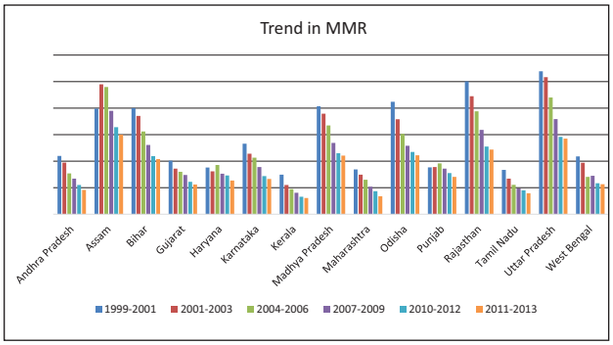
India might have achieved most of the MDG health targets from a statistical point of view going by the trends during the last few years as projected in the India Country Report 2015 on MDGs. However, the progress has not been to the desired level as in all these indicators we should have reached a level that would ensure near nil MMR, SBR and IMR. Considering the socio-cultural and economic diversity of the country, and the population size, more disaggregated indicators are needed to assess the actual ground situation in the case of India. These include apart from the rural-urban divide highlighted above, gender and state-wise statistics also.

As per the data collected by the Office of the Registrar General of India (RGI) through the Sample Registration System (SRS), under five mortality ratio (U5MR) was estimated at 125 deaths per 1000 live births in 1990. This was required to be reduced to 42 by 2015. It had been brought down to 52 by 2012 (SRS). Given the trend, it was likely to reach 49 by end of 2015, thus India missing the target[17]. The figure for 2013 was 49 (India Country Report, 2015, P.68).

The rural areas fair badly compared to the urban areas. In 2013, the U5MR has been 55 in rural areas compared to 29 in the urban areas. Although there has been better decline rate in the rural areas in the recent past, it is the rural figures that keep the average below the target. Similarly, the male-female divide shows a disadvantage for females with the figure at 53 for them and for males at 47.

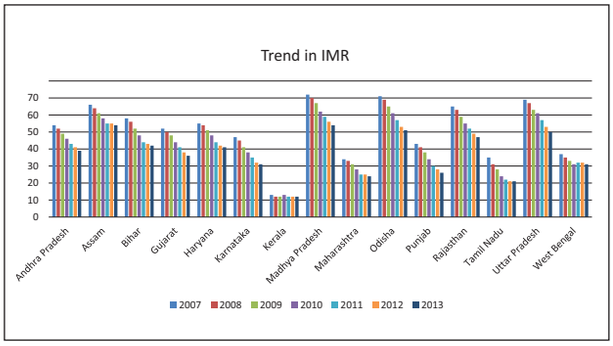
India being a large country with considerably varied demographic profile, what matters is how different states or regions have performed. In this respect, what one finds is that there is wide disparity between states, as could be seen in Figures 6-9.

Figure 6: State-wise Trends in MMR (1999-2013)



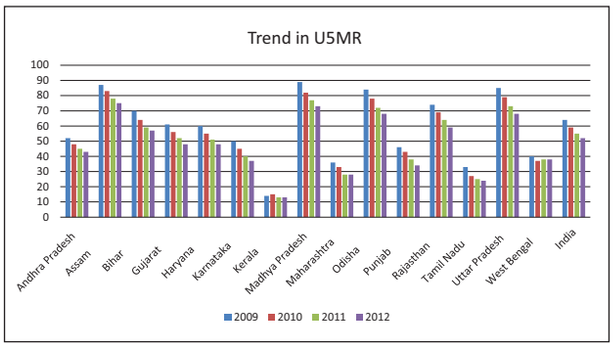
Source: Compiled from National Health Profile 2009, 2012 and 2015.

Figure 7: State-wise Trends in IMR (1999-2013)



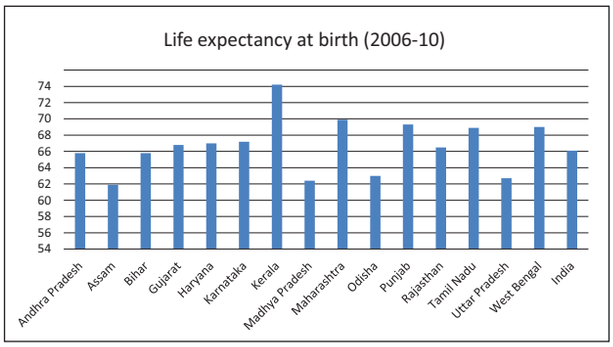
Source: National Health Profile, 2015 and data.gov.in

Figure 8: State-wise Trends in U5MR



Source: Sample Registration System 2009, 2010, 2011, 2012.

Figure 9: Life Expectancy at Birth (selected States)



Source: Sample Registration System, Office of the Registrar General, Ministry of Home Affairs, India.

In the case of Infant Mortality Rate, Goa (9), Manipur (10) and Kerala (12) have levels so enviable compared to Madhya Pradesh (54), Assam (54) and Odisha (51) which are far above the national average of 40 in the year 2013.[18] In regard to maternal mortality ratio, the states of Kerala (61) and Maharashtra (68) lead among major states while Assam (300), Uttar Pradesh (285) and Rajasthan (244) lag way behind. The position is not much better in Odisha (222) and Madhya Pradesh (221) and Bihar (208).[19] The all India average for MMR works out to 167 in the period 2011-13, as per the above report.

Between rural and urban areas also there is wide variation. The urban areas return a figure of 27 as against 44 in the rural areas in IMR. Kerala has IMR of 7 for males and 10 for females with an average of 10 in urban areas, figures that are comparable to those in most developed countries. However, the figures for rural areas in Kerala are 11,14 and 13 respectively. In the poor performing states also, the urban areas have done better than the rural areas. In Madhya Pradesh, the urban average is 37 compared to the rural average of 57. Similar is the case with Assam which has a rural IMR of 56 as compared to an urban IMR of 32.

There are also variations in the figures for the two sexes in the matter of IMR. All across, the rates are lower for males compared to females with the widest variation in the case of Nagaland where the IMR for males is 14 compared to 33 for females, followed by Lakshadweep with Figures of 19 and 29, respectively, Andaman and Nicobar islands with 20 and 28, respectively. Among the big states the variation is maximum in Rajasthan with 45 and 49 respectively. Generally a variation of 2-3 is observable in almost all states, reflecting better attention to male infants.

The worst hit are the rural females with the highest IMR of 59 in Madhya Pradesh followed by 58 in Assam, 54 in Odisha and Uttar Pradesh and 53 in Rajasthan. Certainly the figures for urban children are also poor in these states, but there is a wide variation in rates being lower by about 20 between rural and urban in Madhya Pradesh and Assam.

There appears to be a link between receipt of medical attention at the time of delivery and IMR. In the states where the rates of deliveries under medical supervision or in hospitals were higher, the MMRs and IMRs showed improvement compared to other states with Kerala and Goa having 99.8 per cent live births attended by skilled health personnel and having IMRs of 12 and 9, respectively. In the case of states like Jharkhand and Bihar the percentages of live births attended by skilled health personnel were 47.3 and 53.3, respectively and they were having IMRs of 37 and 42, respectively.[20] This is one reason why the rural mortality figures are higher compared to the urban ones.

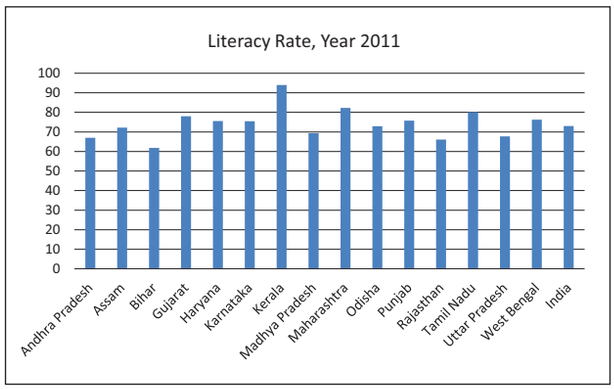
What comes out clearly is that the rural urban divide and male–female divide need to be addressed to improve the health profile of India.

In the matter of fighting particular diseases also, the same pattern is visible. Malaria cases were the maximum in Odisha in 2014 with 388,451 cases followed by Chhattisgarh with 122,480 cases. However, in the matter of deaths due to Malaria in

2014, Tripura is the worst with 96 deaths followed by Meghalaya with 78. Odisha has a number of 73. However, overall, the number of cases and deaths due to Malaria has been declining over the years up to 2013 with the figures going up in 2014.

In other social indicators like education also the states of Kerala, Goa, etc., out-perform states like Rajasthan, Odisha, Uttar Pradesh and Assam. While in Kerala and Goa though the rural females are behind male counter parts and urban counter parts in their own states, they are better than general population in the other states. Generally states who have done well in health indicators have an above national average in literacy rate, thus bringing out a link between literacy and health (see Figure 10).

Figure 10: State-wise Trends in Literacy (1999-2013)



Source: Census of India 2011, Registrar General of India

One reason for the low performance of certain states is the low priority to public health accorded by those states since the per capita public health expenditure in them were low compared to the better performing states (Hooda, 2015: 8). The per capita public expenditure on health had been a measly Rs. 210 in Bihar, Rs. 312 in Madhya Pradesh, Rs. 372 in Uttar Pradesh in 2009-10 (Argade, 2016). In fact, this had been the state for long. Of late, Rajasthan has started spending more on public health and the results are also showing. The states will have to allot more funds for health care.

India had initiated certain specific programmes for achievement of the MDGs. These included the National Health Mission which had two separate Missions within it, namely, the National Rural Health Mission and the National Urban Health Mission. National Rural Health Mission, launched in 2005, provides financial assistance to the States and Union Territories for strengthening the health systems. It aims at improving the infrastructure, human resources and availability of drugs and equipment. To meet the health care needs of the urban population, National Urban Health Mission was launched in 2014 with the focus on addressing the needs of urban poor and vulnerable sections. There has been general improvement in provision of health care infrastructure and human resources but perhaps more was needed as could be seen from India's failure to reach many of the targets. India had achieved total elimination of polio and significant reduction in leprosy cases and incidence of Kala-azar and Lymphatic filariasis [Draft National Health Policy 2015 (NHP)]. In fact, given its status as an emerging economy and home to a large generic pharmaceutical industry, and the constitutional provisions and the commitments made in the National Health Policy 2002, it should have surpassed the targets much before 2015. Though many specific programmes were undertaken, some of them in Mission mode, the status of health in the country is still way below the world average. That leaves questions about the implementation strategies of these programmes.

India and Other Countries

In order to make a proper assessment of India's efforts towards MDGs, it is also necessary to have a comparative picture of the health status in comparable countries. For this purpose, Pakistan and Sri Lanka, the two neighbouring countries with similar histories and Brazil and China, two countries with large population and comparable economic problems have been taken. Table 1 presents the status of certain health indicators in these countries in 1990 and 2000.[21] The comparative figures for these countries in 2015 are also presented in Table 1.

What emerges from Table 1 is that in almost all indicators Sri Lanka, Brazil and China had achieved fairly good progress by 2000. In the matter of adult mortality rate while India, Pakistan and Sri Lanka had comparable status in 2000, Brazil and China had comparable status between them. Post MDG, Sri Lanka, Brazil and China made significant progress in life expectancy, IMR, MMR and adult mortality rate whereas Pakistan and India are lagging behind.

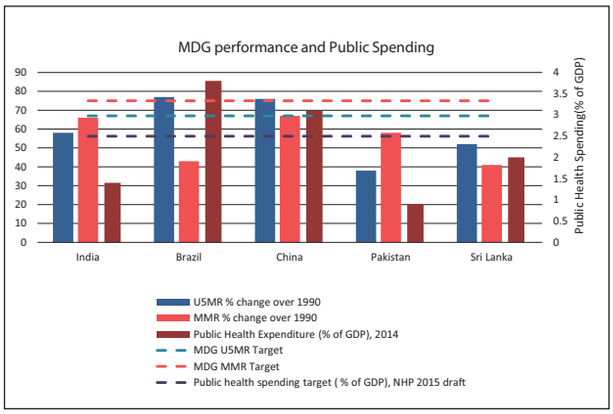
Table 1: Major Health Indicators among select countries (1990-2013/14)

Country	Life expectancy at birth			IMR			U5MR			Adult Mortality Rate		
	1990	2000	2014	1990	2000	2015	1990	2000	2015	1990	2000	2013
India	58	61	68	83	68	38	116	94	48	266	239	201
Pakistan	58	61	66	101	85	66	130	108	81	209	190	173
Sri Lanka	66	67	75	23	17	8	29	21	10	214	210	129
Brazil	67	70	74	46	28	15	56	34	16	212	183	147
China	68	71	76	37	30	9	46	36	11	151	129	90

Source: WHO, World Health Statistics, 2015

In IMR and U5MR, India has done much better than Pakistan during 2000-2015, but Pakistan did better in Adult Mortality Rate. It is interesting to note that in several indicators, India in 2015 is at the level that China was in 1990, pointing to the need for greater focus on health by the country to leap frog from 1990 to 2030. The better performing countries have been spending comparatively more public funds on health as compared to the low performing ones, as could be seen from the World Bank data on public spending as a percentage of GDP and U5MR and MMR percentage reductions from World Health Report depicted in Figure 11.

Figure 11: MDG Performance and Public Spending on Health



Lessons from MDG Efforts

The following lessons can be drawn from the efforts that India made during the period 2000-2015 towards achievement of MDGs.

First, considering the diversity of the country, its size and the differential stages of development between regions, it is necessary to draw up local specific strategies and programmes. Many states in India are much larger than most countries of the world. For example, if Uttar Pradesh is an independent country, it would be the fifth most populous country in the world. The issues and problems differ from state to state on account of varied socio-economic conditions.

Second, along with disaggregation, decentralisation is essential. This is necessary, both to ensure local specific programmes and also community participation. Without such involvement of the local communities, achievement of primary health targets is going to be a very difficult proposition. Kerala has been a good example of this. It launched in 1996 the People's Planning Process and transferred all public health care institutions to the *Panchayati Raj* (local self governments). They were also provided funds with discretion to use. Most such institutions prioritised achievement of sanitation through provision of both individual and community toilets, provision of safe drinking water and equipping primary and secondary health care institutions

Third, preventive health care is what the country should focus first, considering its social and economic status and also factors that contribute to ill health. This will be of two types. One will relate to the environment including safe drinking water, hygiene, etc. The second will be disease oriented like vaccination. Concerted efforts can always bring results. India's experience with the pulse polio vaccination has been a successful example of such concerted efforts. In all the proven vaccine areas, it will have to redouble this effort.

If India has to achieve the SDGs by 2030, it will have to focus on removing the regional and gender disparities. The statistics that drag it down are mainly those of rural females followed by rural males and urban females. The social and economic factors that inhibit reaching out health care facilities to the rural areas and to females particularly to certain vulnerable sections will have to be specifically addressed.

The experience with achievement of MDGs brings out that health cannot be achieved in vacuum. They have to be tackled along with those in other sectors like education women's empowerment, sanitation, availability of clean drinking water, environmental protection and so on. There is a correlation between literacy and health. Also, availability of clean water is a pre-requisite for hygiene. Environmental pollution is fast becoming a major ground of many respiratory diseases. These are the factors that cause ill health and many communicable diseases. In the Indian context, availability of transport facilities in remote areas also plays a significant role in ensuring that patients, including expecting mothers, get timely medical treatment.

Current Status of Health in the country

The present state of health in India poses major challenges since we have to do much to catch up with the developed world and many other developing countries. The current status of health care in India is presented in Table 2.

The major disease burden of India can be categorised into three groups, namely, infective diseases, injuries and non-communicable diseases (NCDs). Achievements so far have not been able to totally contain communicable disease burden in India. A sample list of the major vector borne diseases is presented in Table 3.

The number of cases and deaths due to accidents including natural disasters is also high with the total number at 400,517 of which traffic accidents accounted for 166,506 deaths.

There is a steady increase in proportion of NCDs, including mental health in India due to changing economic status of a good percentage of people. Deaths due to NCDs accounted for 41.8 per cent of total deaths in 2010 (IHME, 2012). Recognising this, India had introduced in 2013 the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS), and the National Programme for Health Care of the Elderly (NPHCE) (MoH&FW Annual Report, 2016). As per a World Bank report, the disease burden scenario for India in 2020 shows significant increase in HIV. The report predicts rise in number of injuries. But the major burden will be in NCDs and diseases linked with old age.

Challenges Ahead

The health sector challenges for India are enormous and complex. The sheer size of the population and the diversity of social, economic, educational and health standards, the status of infrastructure and human resources – all these pose major problems. The diversity gives the country certain advantages also in that the experience of better performing states could be a guide for the others. There are very poor health care facilities in certain areas, and at the same time, there are some world class tertiary care institutions also.

The issues continue to be the same as at the time of announcement of MDGs, as could be deducted from the 12th Plan (2012-17) national health outcome for health system identified by the Planning Commission, namely,

Table 2: Current Status of Health Care in India

Indicator Name	Year	Value
Life expectancy (years) at birth	2014	68.0
Infant mortality rate (probability of dying by age 1 per 1000 live births)	2015	38
Under-five mortality rate (probability of dying by age 5 per 1000 live births)	2015	48
Maternal Mortality Ratio (deaths per 100,000 live births)	2013	190
Public health expenditure (% of total government expenditure)	2013	4.0
Public expenditure on health as a percentage of GDP	2014-14	1.2
Private expenditure on health as % of total expenditure on health	2012	69.5
HIV Incidence rate (per 100 000 population per year)	2013	11
TB Incidence rate (per 100 000 population per year)	2013	171
Malaria Incidence rate (per 100 000 population per year)	2012	1536

Source: WHO, World Health Statistics 2015 and UNDP, Human Development Report 2015, Government of India Budget Estimates 2014-15.

- Reduction of Maternal Mortality Rate (MMR) to 75 by 2017
- Reduction of Infant Mortality Rate (IMR) to 19
- Reduction of Total Fertility Rate (TFR) to 21
- Prevention of underweight children to 23 per cent
- Reduction of anaemia among women aged 15-49 years to 28 per cent
- Child sex ratio to 935

Irrespective of the SDGs, in India's case, these will have to be achieved if it is to ensure health for all.

The most important of the challenges is the absence of a pro-health eco system in most states. India faces a huge problem of open defecation. This has been a source of many epidemics. It, as per an estimate, needs to build 87,584,706 modern toilets in the next three years. The *Swachh Bharat Abhiyan (Gramin)* launched in 2014 aims at achieving a 100 per cent Open Defecation Free India by 2019[22].

Coupled with sanitation is the issue of non-availability of safe drinking water to a majority of the population. The extent of this problem can be gauged from the fact that only 30.8 per cent of the rural households had access to piped water supply[23]. There is wide disparity between states in this matter. In Himachal Pradesh 88.70 per cent rural households have piped water supply whereas in Bihar it is a mere 2.60 per cent only. The immediate challenge is to ensure that all households in the country have access to water with adequate availability of safe drinking water for all. The National Rural Drinking Water Programme envisages that by 2022, at least 90 per cent of rural households are provided with piped water supply. Piped or not, without adequate supply of water, sanitation and hygiene cannot be improved.

Lack of adequate infrastructure, both in health sector and in the supporting sectors like transport, is another problem. According to the Rural Health Statistics 2014, there is a 23 per cent shortfall in Primary Health Centres (PHCs), that is, the required number of PHCs is 29,337 and only 25,020 are in position. A similar trend follows in the case of Community Health Centres (CHCs), wherein states like Delhi and Bihar have a shortfall of 100 per cent and 91 per cent respectively.[24] This is way below the national average of 32 per cent. Coupled with this is the inadequacy of human resources.

Availability and accessibility of affordable medicines and diagnostics is also an issue. Despite having a strong generic pharma industry, the country faces the problem of access to affordable medicine by

Table 3: Incidents of Major Vector Borne Diseases

Disease	No. of Cases	No. of Deaths
Malaria	10,70,513	535
Chikungunya Fever	15,445	NA
Kala-azar	9,241	11
Acute Encephalitis Syndrome	10,834	1,716
Japanese Encephalitis	1,652	292
Dengue	1,462	1
Cholera	969	5
Acute Diarrhoea	1,16,73,018	1,323
Typhoid	17,07,312	429
Diphtheria	4,071	104
Acute Respiratory infections	3,48,14,636	2,932
Measles	23,348	33
Viral Hepatitis	1,39,662	407
Pneumonia	7,09,298	2,661
Tuberculosis	14,43,942	NA
Leprosy	95,042	NA

Source: National Health Profile 2015

large sections of people[25]. More grave than medicines, is the cost of diagnostics. Regulatory systems in health sector leave much to be desired. Unless such systems function effectively, quality and access suffer. This includes the medical councils.

As stated above, India faces massive and diverse disease burdens and by virtue of its large numbers, unless India achieves the SDGs, the global goals will not be achievable. It continues to have high percentages of communicable diseases like TB, Malaria. HIV and so on and also, at the same time, rising share of non-communicable diseases like diabetes, blood pressure, cardio-vascular diseases and so on. India is still primary economy in many respects with agriculture still being the mainstay. Consequently animals and humans interact a lot. As per an estimate, over 50,000 people die daily in India of diseases that emerge from pathogens and animals.[26] India accounts for most of the infant deaths globally. Diarrhoea and pneumonia continue to be the biggest killers in children. Dengue and Chikungunya are also on the increase (Draft National Health Policy, 2015). NCD incidences are also increasing. A study by ICMR projects 17.3 lakh new cases of cancer and over 8.8 lakh deaths due to the disease by 2020.[27]

Malnutrition is a cause of ill health and morbidity. It is behind 55 per cent of TB cases.[28] As per the District level Health Survey of 2013-14, even in a state like Tamil Nadu, which has made good progress in health sector, 49.2 per cent women between the ages of 15 and 49 are anaemic. Naturally, these women in reproductive age group are likely to give birth to under-weight children. Though there have been programmes to address the issue since Independence, the reduction has only been 20 per cent (Planning Commission). It remains a major challenge, "a national shame" (UNICEF, 2013). The U5MR may also be linked with this (Ramachandran, 2010).

The Road to be Traversed

The Resolution adopted by the UN General Assembly on 21 October 2015 has set 13 targets for achieving the goal of ensuring healthy lives and promoting well-being for all at all ages. These, *inter alia*, include reducing maternal mortality ratio to less than 70 per 100,000 live births, reducing Infant Mortality rate to 12 per 1000 live births and U5MR to 25 per 1000 live births. They also mention about ending epidemics like AIDS, TB, and Malaria and combating water-borne and Neglected Tropical Diseases (NTDs) and other communicable diseases, reducing by 1/3rd premature mortality from NCDs, halving deaths and injuries from road traffic accidents. It also targets integrating reproductive health into national strategies and programmes, something which India has already done. Another important target is providing Universal Health Care. This has a significant impact on the delivery of health services. The targets also speak about supporting R&D of vaccines and medicines for diseases that primarily affect developing countries and make a specific mention about providing "access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions of the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all" (Target 3.b). Prevention and treatment of mental health and well being and also reducing deaths and illnesses from environmental pollution also are targets. Increase in health financing is also a target though without any specific percentage.

Way Forward

For the achievement of SDG 3 attention will have to be paid to preventive health care, provision of health care infrastructure and human resources, and financial resources for health care.

Preventive Health Care

The old adage, prevention is better than cure holds good in the case of health care. The approach of focussing primarily on delivery of curative services, which may help in achieving some of the statistical targets, will neither be economical in the long term nor contribute significantly to human wellness, which is the ultimate goal. Most of the communicable diseases (CDs) are on account of unhygienic practices and environment. In order to ensure that people do not fall prey to infectious diseases, sanitation facilities, clean air and safe drinking water will have to be ensured. Initiatives like *Swachh Bharat Abhiyan* will have to be implemented seriously. The fundamental interconnectedness of animal, human and environmental health and systems

is a must in drawing up programmes for SDG 3.[29] Provision of sanitation, safe drinking water, etc., has significant economic impact also. Inadequate sanitation costs India Rs. 2.44 lakh crore or Rs. 2180 per person[30] mostly in health expenditure.

There has been significant reduction in cases of malnutrition in India during the period 2006-2012[31] but has to be totally eradicated. The programmes addressing Anaemia are being administered by different Ministries such as Women and Child Development, Health and Family Welfare, etc. Convergence between programmes of different Ministries will contribute to economy in administration and better results.

Among disease specific preventive measures, the most important ones are immunisation and vaccination. However, such programmes sometimes can come across major hurdles as had happened in the case of Routine Immunisation (RI) programme, in many states.[32] At the same time, there have also been great successes like smallpox, polio and diphtheria vaccinations. In all cases of diseases, for which vaccines are available, vaccinations should be carried out in a mission mode all across the country.

Provision of Health Care Infrastructure and Human Resource

Health Care Facilities

In the provision of global standard health care facilities, the country has to make serious efforts. Although financing would be a major problem, research and development for innovating low cost devices needs to be taken up on priority. There are already examples of such innovations. Popularisation of available devices and R&D to develop more such devices are needed. At the same time, Information Technology can be used to provide healthcare facilities at less expense than at present. Access to super specialists who are ordinarily in big metros can be made available to both doctors and patients in villages and towns through electronic network.

There is need to build huge medical infrastructures in the country. There is only one bed per 1050 patients in India while the United States there is one bed for every 350 patients[33]. India's current ratio of 0.7 doctors and 1.5 nurses per 1000 people is lower than the global average of 2.5 doctors and nurses per 1000 people. This has to be at three levels -- primary, secondary and tertiary. Primary health care will have to be provided at village or hamlet levels. Every village or habitation needs to have a primary health centre under a qualified medical practitioner. This will have to be provided in the government sector, since private sector motivation for doing so will be rather low, though Corporate Social Responsibility (CSR) programmes can, to some extent, be geared for this, at least in urban areas. The Public Private Partnership (PPP) model can also be experimented in that the government sets up the basic infrastructure and then entrusts the service provision to private players, but this will have to be under strict regulatory regimes.

Local Manufacture of pharmaceuticals

This is an area that needs to be considered as an essential tool for achieving health related SDGs. The statistics of the developing countries like India reflect not a healthy picture in this area. Non-complementary dependence on imports for medicines, particularly bulk drugs or Active Pharmaceutical Ingredients (APIs) can have adverse consequences when problems occur in the supply chain (James, 2015). Health is an essential item like water and food and no country should be at the mercy of others since trade flows can get affected by other factors thereby putting lives of people at risk. Appropriate measures to channelise the provisions of the TRIPS Agreement towards this should be taken. This is required to provide affordable access to medicines to all, a *sine qua non* for achievement of SDG 3.

Diagnostic and Treatment Facilities

Modern medical care is highly dependent on diagnostic devices. This sector is protected by intellectual property rights leading to monopolistic practices in manufacture and supply. The prices of these devices remain high thereby making the diagnoses costly. As in the case of medicines, here also indigenous R&D and innovation should focus on more user-friendly, less expensive, new cheaper and better devices that will make the process of diagnoses cheaper and accessible to all. *Swasthya Slate* (Health Tablet) developed by an Indian institution which is being used in by Auxiliary Nurse Midwives (ANMs) and Accredited Social Health Activists (ASHAs) in several Indian states and also in certain other countries, is an example.[34] There is also

need to extensively employ information technology in the provision of health care particularly in remote areas, by providing access to specialists in metros. It can also be widely used in diagnostic care.

Human Resources

Human resources are crucial for achievement of health for all. Developing countries have large populations but the number of qualified health work force is very limited. India is one among the many countries which is facing critical shortage of health care workers.[35] For example, Community Health Centres (CHCs) are the major specialised medical care in the rural areas. Even with the existing infrastructure, there is a shortfall of 83.4 per cent of Surgeons, 76.3 per cent of Obstetricians & Gynaecologists, 83 per cent of Physicians and 82.1 per cent of Paediatricians (Rural Health Statistics, 2015, p. 20).

Medical Education and training of all levels of health personnel need up gradation, both in numbers and quality. As per the WHO guidelines of one doctor per 1000 people, India's proportion of 0.7 physicians per 1000 patients is significantly lower than required.[36] In order to attain the target of doctor-patient ratio of 1:1000, an estimate projects that 187 new government medical colleges will have to be established by 2022 in India.[37]

Unlike the case with other professions, the medical profession provides a vital service that is required by human beings from birth to death and without any distinction of class or gender and rich or poor. Both technical capability building through knowledge impartation and development of social commitment through attitude-making programmes have to be built into the medical education. They have to be innovators, with strong public interest perspective, that is rooted in their local conditions.

Development of Technological Capacity: R&D and Innovation

This is very important for the achievement of the health related goals by all countries. Current status of R&D and innovation in developing countries, except in a few countries, is very low. While the industrialised countries have developed the technological capability and has been investing greatly in R&D, their focus, naturally, has been on drugs that are required in those countries. At the stage of developing the inventions of new chemical entities into medicines, the private pharmaceutical companies play significant roles. But these companies decide their innovation and R&D programmes from the angle of company profit. Since the paying capacity of the population of the South is much less than that of the North, the diseases that affect the South more, get neglected. Therefore, those countries of the South, which have the technological capability, like India, should pay special attention in R&D to diseases like TB, malaria and so on.

A major factor affecting access to medicines in developing countries is the price barrier. Even where medicines are available for diseases, they are priced so high that most populations of the South cannot afford to pay for it. This is the case not only with neglected diseases but also in case of non-communicable diseases like cancer, cardiac problems, etc. The only way to get the price reduced is through competition in drug discovery and manufacturing. Unless, countries of the South invest hugely in pharmaceutical R&D, this cannot be achieved. Basic research cannot be left to private companies who would have no interest in the same. Such R&D has to come from these countries themselves. India with a large scientific community and public research institutions are in a better position than most other developing countries to take the lead in this. The ICMR itself has 32 scientific organisations all across the country. However, the research projects of ICMR have been facing funds crunch (The Hindu, 15 January 2016.). R&D is a costly matter and the institutions need cutting edge technologies, according to the ICMR chief. More R&D in drugs and medical devices needs to be facilitated if India is to reach its health related targets.

India also should make use of its rich traditional knowledge base to develop new drugs like Nobel Laureate Youyou Tu developing the Malaria drug Artemisinin based on traditional Chinese medicine. Government policies and procedures should not impede this but rather make it easy.

Clinical Trials

Clinical trials (CTs) are also an important part of pharmaceutical R&D. Of late, the number of clinical trials, which in India touched 529 approvals in 2010 has been declining since then[38], though global trends are in the upswing. Specific remedial measures will have to

be taken to make the CT Guidelines user friendly both for investigator and patient. For diseases like Kala-azar which is a sub-continental phenomenon, unless CTs are done in the subcontinent, new vaccines and drugs will not be innovated.

Effective Use of ISMs

India has a very sound Indian Systems of Medicine (ISMs), namely Ayurveda, Siddha and Unani, which are based on scientific and logical principles (Chaturvedi, *et al.*, 2014). In the onslaught of modern medicine, the practical role that traditional medicines like the ISMs can play in health care has been generally neglected. There are 7.9 lakh AYUSH (Ayurveda, Yoga, Unani, Siddha and Homoeopathy) practitioners registered in India.[39] They, however, have not been effectively used in health care,[40] though some states like Rajasthan have taken initiatives in this regard under the National Rural Health Mission. Very often there are cost effective cures for many widely prevalent local diseases in these systems. The systems also require innovative inputs and generation of new medicines, novel methods of treatment and so on. Research and innovation has to focus on these areas.

Financial Resources

The major hurdle in achieving health for all is health care expenditure. It is an expensive activity from the individual perspective. Being rather of a necessity, people incur expenses on this even when they find themselves in an unaffordable situation. In a country where average per capita GDP is US$ 1581.5 during 2011-2015, that is equivalent to 10 per cent of the world average[41], the burden that can be borne by individuals is limited. India's Out of Pocket (OOP) health spending rate is one of the highest in the world with 89.2 per cent of private expenditure pushing millions to poverty every year.[42]

In 2012, India's total share in health care expense as a percentage of GDP was 4.05 per cent compared to the world average of 10.14 per cent (Kalam and Singh, 2015, p. 69). Even after adjusts to purchase power parity, except South Asia all other regions and most countries have been spending more on health care than India. The US expenditure was more than 125 times that of India. The per capita health expenditure in India during 2014 was US$ 75 whereas in the USA it was US$ 9403.[43]

Also the share of public health care expenditure in overall health expenditure in India at 30.5 per cent is one of the lowest in the world, the global average being 59.8 per cent; even the US has a figure of 46.4 per cent. The total public health investment has been low during the last many decades hovering around one per cent of the GDP (National Health Policy 2002 and Draft National health Policy 2015).

Table 4: Per capita Health Expenditure in Select Countries (in US$)

Country	1996-2000	2001-05	2006-2010	2011-2015
India	66	65	69	75
Pakistan	37	33	34	36
Sri Lanka	96	93	120	127
China	279	329	375	420
Brazil	1055	985	993	947

Source: World Bank.

Table 5: Public Health Expenditure as a Percentage of Total Health Expenditure

Country	1996-2000	2001-05	2006-10	2011-15
India	27.1	27.0	28.4	30.0
Pakistan	30.6	36.9	36.8	35.2
Sri Lanka	42.1	38.0	57.2	56.1
Brazil	45.2	44.3	45.1	46.0
China	55.9	56.0	55.8	55.8

Source: data.worldbank.org

While successive governments, both at central and state levels, were committed to provide health care facilities at an affordable rate to all citizens and have announced many policy and programmes, competing priorities of development of a developing economy made adequate public funding for health difficult. The economy has now reached a stage where the governments can devote maximum funding for social sectors that affect human development such as health, education and so and allow the private players to take care of the manufacturing and service sectors. The private sector has also emerged as a major provider of health services such as diagnostic centres and hospitals, particularly tertiary level speciality care.

Allocation of financial resources for health sector should be weighed in with the possible adverse impact of ill health on economic growth. Number of studies have brought out that diseases cause a burden on the economy in the form of loss of productive capacity of the people.[44] As per a study,[45] India lost 3.10 crore years of healthy life to mental illness (Dementia, Anxiety Syndrome, Substance Use and Epilepsy) in 2013 alone.

The dominance of private out-of-pocket expenditure in the cost of health care is bound to be regressive (Srinivasan, n.d.). The 12th Plan envisaged reduction of households' out-of-pocket expenditure from 71 per cent to 50 per cent of total health care expenditure by 2017.[46]

Comparison with the four countries referred to earlier shows that per capita health expenditure in India has remained the lowest except for Pakistan consistently since 1996 (see Tables 4 and 5). China has shown significant increase over the years, naturally resulting in better health indicators.

What comes out clearly is that public health expenditure as a percentage of total health expenditure is the lowest in India. This is not at all a desirable status and the country will have to take earnest measures to rectify the situation. Without government bearing at least fifty per cent of the health expenditure, the country is not going to achieve the SDG 3.

Investment in health is the cornerstone of development. The requirement of finances for India to achieve the health goal has been estimated at Rs. 55 lakh crore. But if the budget allocations continue as per the present trends, an estimated gap of Rs. 19 lakh crore has been projected (Technology and Action for Rural Achievement, 2015: 66). This is a huge difference and needs to be bridged. But policymakers should realise that investment in health is an investment in the future of the country and will be a big saving for the economy by reducing loss of productivity on account of illness.

Conclusion

Provision of health care being a constitutional responsibility, the central and state governments have to give it the highest priority. India's commitment to the achievement of SDG in health is to be seen not only from the angle of an international declaration but from the government's basic duties. Investment in health sector in the long term makes good economic sense too. The SDGs provide an ambience and an international justification for governments to take pro-active health measures. Considering the primacy of health and wellness of all human beings, this should be an opportunity for the governments to take stock of provisions in other treaties and make changes, if any, required in them to facilitate the progress toward a healthy world.

Post the UN Sustainable Development Summit, India has put forward an ambitious Draft National Health Policy in 2015, which covers health care delivery services very well. It talks about programmes for addressing CD and NCDs with the laudable aim of "the attainment of the highest possible level of good health and well-being, through a preventive and promotive health care orientation in all development policies, and universal access to good quality health care services without anyone having to face financial hardship as a consequence."[47] It recognises the salience of preventive and promotive health, integration of AYUSH with main stream, and ensuring adequate investment. What is needed is concrete and comprehensive programmes on these lines. Unless that is done, the SDGs will remain a distant dream. As the policy itself recognises, "a policy is only as good as its implementation." [48]

Endnotes

1 Article 47 of the Constitution of India.
2 Article 39 (a) ibid.
3 Article 39 (f) ibid.
4 Article 47 ibid.

[5] *Akhil Bharatiya Soshit Karmchrari Sangh v. Union of India* (1981) 1 SCC 246.

[6] *Kesavananda Bharati v. State of Kerala*, (1973) 4 SCC 459.

[7] Enku Kebede-Francis, Global Health Disparities: Closing the Gap Trough Good governance. 2011. ISBN 978-0-7637-7893.4., P.86.

[8] Tenth Five Year Plan (2002-2007), Vol. II, p.81. Planning Commission.

[9] Ibid.

[10] Preamble to the Constitution of the World Health Organisation adopted by the International Conference on Health held in New York in June-July, 1946 and entered into force in April, 1948. India became a Party to the WHO Constitution as early as 12 January 1948. (See http://www.searo.who.int/india/about/en/)

[11] Article 25 of the Universal Declaration of Human Rights.

[12] http://www.who.int/about/history/en/

[13] Planning Commission 10th Five Year Plan, p.119

[14] As per a report in the *Times of India* dated 21 March 2016, India accounted for 23 per cent of global cases and most deaths (220,000) due to TB in 2014. As per that report an estimated 2.2 million people suffer from TB in India.

[15] http://mdgs.un.org/unsd/mdg/Resources/Attach/Indicators/OfficialList2008.pdf

[16] The data does not include that relating to Jammu & Kashmir due to non-receipt, as per the data sources.

[17] The 2015 data is not available.

[18] Government of India, National Health Profile 2015. P.20

[19] Ibid. P.21

[20] India Country Report 2015. Pp. 74 and 95.

[21] http://www.who.int/gho/publications/world_health_statistics/EN_WHS10_Full.pdf

[22] http://sbm.gov.in/TSC/Report_NBA/Physical/Rpt_TargetVsAch_SelectionBased.aspx?id=Home

[23] http://pib.nic.in/newsite/PrintRelease.aspx?relid=101803 dated 16 December 2013.

[24] Rural Health Statistics, data.gov.in

[25] http://apps.who.int/medicinedocs/documents/s18025en/s18025en.pdf

[26] *Asian Age*, 8 February 2015 on reporting the Zoonosis Conference held at KEM Hospital, Mumbai in February 2015.

[27] A country wide study during 2012-14 from various population based and hospital based cancer registrations as reported in https://www.biotecnika.org/2016/05/icmr-reports-2020.

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[30] *The Economic Impacts of Inadequate Sanitation in India*, Water and Sanitation Program, World Bank. P.2

[31] Global Nutrition Report 2015: Actions and Accountability to Advance Nutrition and Sustainable Development. P.39

[32] "Immunisation Coverage in India, An Urban Conundrum" by Purnima Dasgupt and Rajib Dasgupta, *Economic and Political Weekly,* 23 May 2015, Vol. L. No. 21.

[33] Deloitte (2015). "Health care Outlook for India." Available at https://www2.deloitte.com/content/.../gx-lshc-2015-health-care-outlook-india.pdf.

[34] A blue-tooth enabled integrated diagnostic device that works with android-based mobile system to perform 33 diagnostic tests. See http://www.thebetterindia.com/49931/swasthya-slate-kanav-kahol-delhi-diagnostic-tests

[35] http://www.who.int/whr/2006/06_chap1_en.pdf

[36] http://data.worldbank.org/indicator/SH.MED.PHYS.ZS

[37] http://www.dailyo.in/politics/medical-council-of-india-healthcare-mci-doctors-wanted-india/story/1/10483.html

[38] See http://www.cdsco.nic.in/

[39] Planning Commission, Report of the Steering Committee on Health for 12th Plan, p.48.

[40] ibid, p.7.

[41] data.worldbank.org

[42] http://data.worldbank.org/indicator/SH.XPD.OOPC.ZS

[43] Data.worldbank.org.

[44] "Economics of Non-Communicable Diseases in India." *World Economic Forum.*

[45] The Lancet, 18 May 2016.

[46] P. 9.

[47] Para 3.1 of the draft National Health Policy.

[48] ibid, Para 13, Pg. 57.

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Annex

Goal 3: Ensure healthy lives and promote well-being for all at all ages: Targets and Indicators	
3.1 By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births	3.1.1 Maternal mortality ratio 3.1.2 Proportion of births attended by skilled health personnel
3.2 By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births	3.2.1 Under-five mortality rate 3.2.2 Neonatal mortality rate
3.3 By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases	3.3.1 Number of new HIV infections per 1,000 uninfected population, by sex, age and key populations 3.3.2 Tuberculosis incidence per 1,000 population 3.3.3 Malaria incidence per 1,000 population 3.3.4 Hepatitis B incidence per 100,000 population 3.3.5 Number of people requiring interventions against neglected tropical diseases
3.4 By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being	3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease 3.4.2 Suicide mortality rate
3.5 Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol	3.5.1 Coverage of treatment interventions (pharmacological, psychosocial and rehabilitation and aftercare services) for substance use disorders 3.5.2 Harmful use of alcohol, defined according to the national context as alcohol per capita consumption (aged 15 years and older) within a calendar year in litres of pure alcohol
3.6 By 2020, halve the number of global deaths and injuries from road traffic accidents	3.6.1 Death rate due to road traffic injuries
3.7 By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes	3.7.1 Proportion of women of reproductive age (aged 15-49 years) who have their need for family planning satisfied with modern methods 3.7.2 Adolescent birth rate (aged 10-14 years; aged 15-19 years) per 1,000 women in that age group
3.8 Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all	3.8.1 Coverage of essential health services (defined as the average coverage of essential services based on tracer interventions that include reproductive, maternal, newborn and child health, infectious diseases, non-communicable diseases and service capacity and access, among the general and the most disadvantaged population) 3.8.2 Number of people covered by health insurance or a public health system per 1,000 population

3.9 By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination	3.9.1 Mortality rate attributed to household and ambient air pollution
	3.9.2 Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services)
	3.9.3 Mortality rate attributed to unintentional poisoning
3.a Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate	3.a.1 Age-standardized prevalence of current tobacco use among persons aged 15 years and older
3.b Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines, in accordance with the Doha Declaration on the TRIPS Agreement and Public Health, which affirms the right of developing countries to use to the full the provisions in the Agreement on Trade-Related Aspects of Intellectual Property Rights regarding flexibilities to protect public health, and, in particular, provide access to medicines for all	3.b.1 Proportion of the population with access to affordable medicines and vaccines on a sustainable basis 3.b.2 Total net official development assistance to medical research and basic health sectors
3.c Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States	3.c.1 Health worker density and distribution
3.d Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks	3.d.1 International Health Regulations (IHR) capacity and health emergency preparedness

4

India's Steadfast Approach to Quality, Equity and Inclusion in Education: Views from Experts

Introduction

In September 2015, at its Sustainable Development Summit, the United Nations adopted the 2030 Agenda for Sustainable Development comprising 17 Sustainable Development Goals (SDGs). SDGs (2016-2030), built on the Millennium Development Goals (MDGs) (2000-2015) are much more comprehensive covering the three dimensions of development, i.e. social, economic and sustainability. This is a transformative agenda with a very robust means of implementation framework at the global and national levels and pledges to leave no one behind. The Prime Minister of India along with other world leaders signed the declaration and India has very enthusiastically welcomed this agenda. On its current trajectory, both at the centre and in States, India has already set for itself more ambitious targets in several areas of economic progress, inclusion and sustainability. Role of State governments is central to the implementation of these programmes, as well as design convergence with the SDGs in order to effectively influence all social and economic parameters to achieve the SDGs.

MDG 2 mandated achievement of universal primary education only. The SDG 4 mandates ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all. The targets under this goal cover learning outcomes, pre-primary education, secondary, tertiary and vocational education. The emphasis along with access is on equity and inclusiveness and sustainability education. NITI Aayog, in collaboration with the Research and Information System for Developing Countries (RIS) and in partnership with UN, organised a two-day national consultation with the States in New Delhi on 9-10 February 2016, to discuss issues related to health and education (SDG 3 and 4).

In this paper we re-produce the key messages that emanated from the deliberations on SDG 4, i.e. education and attribute those to respective policymakers and experts. The presentation of the content would cover important areas in Education policy and practices that are of major relevance to India. At a time when India realises the virtue and merit of quality education for all, the incumbent SDG agenda can only strengthen the resolve towards course correction and innovative solutions in this area. Given the sheer size of the country with most diverse trajectories of social development based on regional history, there is little surprise in discovering wide divergence in education outcomes across the country. While India can boast of its economic emergence supported through higher education among a priviledged fraction of the population, lagging learning outcomes at primary and elementary levels, sometimes despite physical access is a mammoth challenge. The progress achieved in terms of economic prosperity may not be sustainable unless larger fraction of the population is confident and can stand up on their own feet through mastery over knowledge and skills. Quality education brings people closer to economic opportunities. However, with very serious thoughts going into sustainability issues globally, India has to make sincere attempts at devising policy and institutions in the education sector so that beginners are better equipped to make reasonable choices for a sustainable future.

The opinions presented here highlights challenges as well as the opportunities. The thematic messages should inform policymaking at different levels both at the centre and the States to achieve better outcomes.

Prof. Ramesh Chand on Four-pronged Challenge

(Prof. Ramesh Chand is Member of NITI Aayog)

Prof. Ramesh Chand quoted Late Prime Minister Chaudhry Charan Singh to exemplify the link between education, opportunities and intergenerational inequities that lead to chronic developmental challenges. The quote runs as follow: 'Tumhare mein aur mere mein yeh farq hai, tumhari daadiyan bhi padhi hui hain aur meri potiyan bhi unpadh hain', which he had said while illustrating rural urban divide in India. What the former PM said was, the difference between urban and rural life is that in urban areas grandmothers are also educated whereas in rural areas even granddaughters are uneducated. This speaks plenty about education and how education creates disparity, how education creates deprivation and how education can itself help in bridging this gap.

The four-pronged challenge confronting the Indian education system is as follows:

- **Inclusiveness:** The 11th Five-Year Plan put a lot of emphasis on inclusive growth. When growth was picking up in India, many people thought that this growth is resulting in increase in inequality, this growth is jobless and jobless growth is joyless. This brought back the focus on inclusive growth. This is crucially linked with inclusiveness in education. Every citizen, notwithstanding his or her circumstances or social background has right to education. Exclusions thriving in social boundaries, gender disparities, regional backwardness, and ethnicity add to the problem.
- **Equity:** Equitable education is related to the existing gaps between levels of education. It is not sufficient to spread literacy alone. Skewed educational levels reflected in very few reaching levels of higher education and majority constrained by circumstances to venture beyond primary and elementary education is not a desired scenario. The gap accentuated by gender discrimination and other exclusions need urgent attention.
- **Quality:** While, India has achieved significant expansion of schooling opportunities at the primary as well as the secondary levels, the concern of quality education has come to haunt policymakers. This is reflected in the fact that students achieve poor learning levels measured in terms of their comprehension and numeracy levels. While the rural-urban divide in this regard is very prominent, the deterioration in the quality of school education is telling. Difference in the quality of education between rural and urban areas also forces people to migrate. On the other hand, even in urban areas quality comes with increased cost as city schools with higher fees tend to take quality more seriously than others creating new boundaries of exclusion. This completes the full circle where inclusiveness, equity and quality reinforce each other, only to amplify the challenge.
- **Employability:** The final issue is that of divergence between education and skills which has deepened over years creating major hindrance for the Indian youth to join the organised labour market aided by self-selection characteristic of job search. Education followed through academic curricula in India is inadequate in terms of training students in technical and non-technical skills required for a wide array of modern professions across agriculture, industry and services. Widespread skill development is lacking in the Indian education system which leads to poor employability. Finally, education is not designed to promote entrepreneurship.

Ms. Rina Ray on Parameters of Assessment

(Ms. Rina Ray is Additional Secretary, Ministry of Human Resource Development, Government of India)

The very fact that we are now able to talk about quality is because about 97-98 per cent of children are actually in school today, affording us the luxury of focussing on quality which we could not have done earlier. We have also achieved lower dropout rates largely due to the right to education act provision of no detention in schools. For many school children schooling had become something of a painful chore when having failed in class they were derailed. The no detention policy has been very critical in actually retaining

children. Now the question is how do we ensure that they are actually learning.

The PM has launched the Ek Bharat Shreshth Bharat programme which is aimed at cultural integration and education plays an important component. The Ministry of Human Resource Development (MHRD) has launched Rashtriya Avishkar Abhiyan and Padhe Bharat Badhe Bharat programme. The school leadership development programme, the National Repository of Open Educational Resources (NROER) of the National Council of Educational Research and Training (NCERT), and the Swacch Vidyalaya Initiative are other flagship programmes that resulted out of PM's call that every school should have gender segregated toilets and the ministry managed to do that within one year. Swacch Vidyalaya is strongly monitored especially online with ICT initiatives. On the other hand, NCERT has now digitised all its books available online and the rating of that on google play store is 4.5.

Saransh is an initiative of CBSE to allow schools to identify areas of improvement in students, teachers, curriculum and take necessary measures to implement change by comparison of results. Shaala Siddhi another initiative designed by the NEUPA team which allows schools to self-monitor. The Unified-District Information System For Education (U-DISE) is the largest database of schools in the world. However, the drawback is that this is only a school based database and may not capture information about pupils. About fourteen states have started child tracking database including Maharashtra to monitor performance of individual pupils purely from a policymaking and policy design perpspective. There is a proposal to convert the U-DISE into a national child base tracking system linked with Aadhar or any other ID based system. U-DISE covers all schools in India including the private schools. This can potentially create a database of 250 million students. However, there are sensitive issues like privacy and security. Therefore, discretion around its use has to be firmly institutionalised.

Another initiative under consideration is largely based on the Gunotsav initiative of Gujarat with other states like Maharashtra, Madhya Pradesh, Orissa, Chhattisgarh whereby every school conducts a self-monitoring assessment which is followed up by random external evaluations to check the infrastructure and teacher attendance. Private schools should also participate on voluntary basis. Ambitious initiatives are being implemented to attain reasonable and threshold learning levels among school children at the primary levels. The instruments under such initiatives include flexible outcome approach. The States would be free to choose the process and the Centre would only be interested in the outcome.

The government is also focusing on the capacity building of teachers and monitor them through online portal. This programme would need collaboration with non-governmental organisation (NGOs) in certain cases. There are plans for volunteer programmes to give opportunities to retired teachers and retired professionals including members of the Indian Diaspora abroad who would like to contribute capacity building in schools of their choice. The MHRD is preparing a bill called the Unfair Practices in Schools to regulate arbitrary fees being charged by private schools and bring accountability. Private schools are also being encouraged to voluntarily participate in Shaala Siddhi as means of accreditation and standardisation. Experience suggests that even in the case of schooling, scale matter. Rationalisation and consolidation of schools to two to three roomed school buildings have not been very successful.

The other proposals on institutional reforms include separate cadre of headmasters and a management information system for teachers. There is a need to manage issues of job conditions of teachers that are often taken up by teacher unions. At the same time unreasonable postures and inflexibilities confronted in areas like postings to remote areas, etc., should not come in the way of fulfilling the objectives. An institutional framework that encourages teachers towards best academic commitment and accountability has to be designed.

But the last and perhaps most critical point is the whole issue of funding of education in India. We are far from the desired 6 per cent of GDP benchmark or even near that in any sense of the word. And if we are to move towards achieving the SDGs we need to work at increasing not just the government funding but leveraging funding through CSR, the public-private

and volunteer initiatives. The states have recently got larger devolution of funds under the 14th finance commission. NITI Aayog is expected to guide states in matters of education expenditure and ensure threshold bounds even as other social sector expenditure could be equally demanding. To achieve the objectives discussed earlier central ministries and departments should work together as a team with their counterparts in States.

Prof. J.B.G. Tilak on Institutional Responses to Quality and Sustainability

(Prof. J.B.G. Tilak is Vice Chancellor, National University of Educational Planning and Administration - NUEPA)

Quality of education is quite difficult to measure and monitor. But obviously it should be inclusive of almost every dimension of education, namely, personality development through cognitive or non-cognitive abilities, skill inculcation, knowledge creation, knowledge transmission and inculcation of values and attitudes besides many other aspects. We have focussed for a very long period on the infrastructure facilities like school buildings, construction of boundary walls, classrooms, drinking water, toilets and also on developed indicators based on these aspects. But among the several inputs that we have been talking about, the most important one is the teachers. Good teachers are backbone of our education system and hence unfilled vacancies for too long would delay prospective outcomes. The situation is serious with around 16 per cent vacant positions at the elementary level, as high as 57 per cent at the secondary level and about 30-40 per cent in higher education. We have high pupil-teacher ratios but we have developed good indicators for monitoring aspects like pupil-teacher ratio or class teacher ratios, female teachers as a proportion of the total teachers; and, quality of teachers in terms of the training level of the teachers. However, effectiveness of ICT aided teaching practices has not been conclusively determined at least for the primary levels.

Recently much more emphasis is being given for in-service training apart from pre-service training and also on teachers support structures at cluster centres, block resource centres, etc. However, such facilities need to be strengthened. The objective for all these is to inculcate academic as well as leadership qualities among teachers. Major attention has been given to curriculum reforms not only to rationalise teaching load but also to introduce meaningful skill education. The future needs would be in terms of also including social, democratic and sustainability values in education.

There are also issues with respect to medium of instruction, particularly at primary schools. There are also attempts to make some assessment and examination reforms in the elementary schools and now we have continuous and comprehensive evaluation in place of regular annual examinations. One of the major programmes launched in the last 20 years is the mid-day meals programme which is said to be one of the effective programmes that would improve not only the nutritional status of the children but also increase the participation levels of the children in the schools and also their learning abilities quite considerably. Evidence indicates encouraging results in this regard.

One important area of debate in recent times is around learning versus schooling. But we should also recognise that if we shift the focus quite significantly, then we are de-emphasising the importance of school systems. We need formal school structures and good formal school structures alone can take care of good learning process. Desired results in this regard can be achieved through effective monitoring. It is absolutely necessary to realise that quality of education involves costs. One has to spend adequately to achieve quality in education. We have evidence to show that good investments in quality related inputs like textbooks and teacher training lead to better outcomes.

Finally, current schemes and policies cater to short term needs. Our vision is also short term in planning those programmes and as a result we carry out such policies for a few years and then we withdraw many of them without even evaluating their results. In fact, quite often we start a scheme and immediately start the evaluation also without giving them necessary time. Obviously most investments in education have long gestation periods. So it is very important to note that we have to have sustainable development approach to realise sustainable development goals.

Ms. Alka Tiwari on Possible Roadmap on Access and Equity

(Ms. Alka Tiwari is Adviser in NITI Aayog)

We have the demographic advantage of having a young population. Their average age is 29 years. If we want to harness this demographic dividend we need to focus on health, education and skill development. In so far as education is concerned, 12th Five Year Plan lays focus on expansion, improving quality and equal education opportunities for all segments of society. Very recently NITI Aayog has completed the mid-term appraisal of the 12th Five Year Plan. We discuss some issues that emerge out of that assessment.

To achieve the goal of universalisation of education and also to address the equity issue, the Right of Children to Free and Compulsory Education Act 2009 was put in place. It became operational in 2010. It provides for inclusive elementary education for all and 25 per cent quota in private schools for children from economically weaker sections, Scheduled Castes (SC), Scheduled Tribes (ST), Other Backward Classes (OBC) and minorities.

We have achieved 72.99 per cent overall literacy but still there is gender gap of 16.25 per cent and female literacy among ST is much below other categories. Enrolment has gone up, number of schools have gone up, dropout rate has come down, out of school children have come down. Gross enrolment ratio and net enrolment ratio have increased. At primary level and upper primary level, pupil-teacher ratio has come down. However, according to Annual Status of Education Report (ASER) findings, 48 per cent of Class 5 children can read at Class 2 level only. If we take National Achievement Survey(NAS) also, the picture is not much different although there is a lot of debate between ASER and NAS but basically they point to the fact that the quality of education is not very good and learning outcomes are very very poor.

The government initiated the following programmes to reduce gender gap and improving nutrition:

- Kasturba Gandhi Balika Vidyalaya: It is operational in 3602 blocks. This covers a substantial number of girls and there is a fair distribution amongst all the disadvantaged groups whether SC/ST/OBC.
- Mahila Samakhya: It has been instrumental in women's empowerment and increasing enrolment rate among girls.
- Beti Bachao, Beti Padhao: This programme is for districts where the child sex ratio is poor.
- Mid-day Meal scheme: Apart from addressing nutritional needs it has also helped in empowering women. 80 per cent of cook-cum-helpers are women.

We still have a substantial number, 61 lakh children are out of school. This number includes street children and children with special needs. Then within SC/ST minority groups there is need to focus on the education of the girl child. We need to have additional Kasturba Gandhi Balika Vidyalayas specially in educationally backward blocks.

Gross enrolment ratio have gone up in secondary education. Drop-out rate has come down. Number of schools have gone up and according to our assessment we are on way to achieving 12th Plan targets. The equity issues need to be addressed. In higher education, our thrust area in the 12th Plan was expansion, equity and excellence. Gross enrolment ratio has gone up significantly in higher education. It is very close to the target we had set for 2017 and even the target which we have set for 2020, that is 30 per cent, it appears quite achievable. There has been an increase in the number of universities. There has been an increase in the number of colleges. Number of diploma level institutions have gone up. And in all these centrally sponsored schemes there has been increased spending and we have consolidated and upgraded central institutions and skill based programmes.

Leaving No One Behind

For tribal children who are living in remote areas we need to have residential schools. We need to have seasonal hostels for children who are migrants specially in urban areas. Unless we provide them transport facilities, they will not be able to come to school. And we have also seen that in states like Jharkhand and Chhattisgarh where the scheme of providing cycles to girls has been sanctioned, there has been an increase in enrolment as well as retention of girls.

Then on learning enhancement and supplemental instruction we see that the children who are coming to school specially from disadvantaged sections,

they do not have sufficient exposure to numeracy or literacy by the time they come to school. So they require supplemental instruction. There has to be focus on teachers training, community mobilisation and involvement of local authorities. Sensitisation of teachers through such means could be effective in bridging equity gaps.

Improving Quality

Early childhood education under Integrated Child Development Services (ICDS) scheme in Anganwadi centres has to be properly monitored. Unless pre-primary education is effective, it may be hard to achieve quality learning outcomes at a later stage. Availability of good quality teachers and adequate number of teachers across geographical locations (timely filling of teacher vacancies) lead to best learning outcomes. There has to be institutional provisions of carrot and stick to minimise absenteeism among teachers and retain them in schools in rural and remote areas. There has to be proper monitoring of unethical and unprofessional teaching practices like subletting and tuitions outside schools in order to achieve higher standards. Last but not the least decent and modern infrastructure in schools would create the right ambience and ecosystem for the pupil and teachers alike to jointly contribute to quality learning outcomes.

We need to have convergence with other programmes like National Rural Employment Guarantee Act (NREGA), Digital India for school infrastructure, toilets and digitisation, among others. Conditions of lifelong learning needs to be promoted to fulfil the objectives under the SDGs. It means that instead of basic literacy we have to concentrate on lifelong learning and we should have the capability to use information and knowledge wherever available, print, mass media or internet. Saakshar Bharat scheme caters to this goal of lifelong learning.

Ms. M.S. Jaya on the Experience of Kerala

(Ms. M.S. Jaya is Director of Public Instruction, Government of Kerala)

Kerala is the first state to achieve 100 per cent primary literacy. Enrolment is more than 100 per cent in Kerala because in addition to all the children in Kerala we have students from other states, primarily children of migrant labourers. And as far as equity goes Kerala provides free textbooks and free uniform to all children in all schools. Amenities to children with special needs are ensured in all schools and performance of the mid-day meals scheme is noteworthy. Kerala also provides different kinds of scholarships for girls, SC/ST and minorities. Appointment of resource teachers to attend to children with special needs is a Government of India scheme and it is functioning well in Kerala. Kerala has also launched special enrolment drive in SC/ST/ Minority concentrated areas. Part time instructors are also provided with the help of Sarva Sikshya Abhiyan. The improvement of quality is being implemented through provision of science lab, computer lab and libraries. Other focus areas include leadership training of school heads through special programmes.

Curricular reforms are being implemented. Science and maths education is being given special stress and computer aided education has been made a must in all the schools in Kerala. Teaching and learning aids are provided to teachers and remedial teaching is also there for students who are very weak. Special attention is being given to girl students and students from economically and socially disadvantaged sections of society.

Other Initiatives

- In addition to mid-day meals, one glass of milk twice a week and one egg in a week is provided. Some corporations and local bodies and even some panchayats provide breakfast to children.
- Special coaching is given to students who are below the expected level.
- Various clubs like environment clubs, health club, science club, etc., are encouraged in each school and all the students have to be in one of these clubs.
- Schools take up the campaigns on nature conservation and carry out community awareness programmes. That is also done with the help of forest department and agricultural department.
- Vegetable cultivation is promoted in schools to encourage eco-friendly living
- Kerala organises annual school youth festival. All vegetables needed for festival feast are collected from the eco-friendly cultivation done by students.
- Many schools are declared as plastic free zones.

- Co-curricular activities include Student Police Cadet programme where students are trained by police department and these students act as deterrent against children falling prey to evils like smoking, drinking and substance abuse.
- Under internal support mission schools are visited twice a month to individually interact with teachers in the evening to understand their difficulties.
- Gifted children programme is meant for specialised training for classes 8, 9 and 10 and above.
- Under Additional Skill Acquisition Programme (ASAP), reading rooms and reading corners are provided in all schools.

Prof. Chandan Mahanta on use of ICT for achieving Quality in Education

(Prof. Chandan Mahanta is Professor of Civil Engineering and Dean Student Affairs at IIT Guwahati)

The Indian Institutes of Technology (IITs) that are the best institutions of higher learning in technical and engineering fields give equal opportunities to all, irrespective of their backgrounds, on the basis of individual merit. However, incidence of suicides among students apparently due to difficulties arising out of academic pressure and strict evaluation criteria come to question the institutional framework and might eventually become counterproductive in terms of equity considerations. IIT Guwahati has taken steps in the form of appointing psychological counsellors (of both genders) to address this issue. Appropriate institutional data management systems to monitor individual students and the variations in their academic performance should be used for effective and timely interventions. Moreover, inspiring interactions with the President and the Prime Minister over the National Knowledge Network on a regular basis has been encouraging for students. Such ICT based platforms should provide direct access to policymakers and should facilitate direct interactions with them to expedite institutional reforms aimed at student welfare.

IITs are helping in quality improvement at primary and secondary levels through demonstration projects with the aid of information technology. These activities involve training of primary teachers and science teachers across schools. Numbers achieved under such projects are quite impressive. Such efforts are extended to provide inputs to other engineering colleges through uploading IIT course curricula and contents online. In remote areas like the North East, IIT Guwahati has helped create virtual facilities. Such instances of innovative sharing of knowledge would also inspire IIT students to pursue out of the box ideas for social development in the span of their professional career.

Prof. K. Ramachandran on Targets and Indicators for SDG 4

(Prof. K. Ramachandran is Advisor, National University of Educational Planning and Administration - NUEPA)

The only objective of education is learning. If students don't learn, there is no point in having schools or other systems in place. In this context, learning outcomes assume top most priority. The other issues under consideration are: equity and inclusion particularly gender equity and conditions of lifelong learning.

Definition of inclusion should mean access to success and not just access to schooling facilities. Access to success means learning outcomes. Two things are important for quality assessment apart from learning outcomes, firstly, relevance and secondly, the method of lesson itself. At the institutional level resource efficiency can also be a yardstick for quality.

UNICEF defines quality as a composite of learning, quality of learning environment, the inputs, quality of learning contents, the curriculum, the quality of teaching processes, the teacher and the process and quality of learning assessment. The SDG 4 covers seven outcome targets and three means of implementation. It also covers four levels of indicators, namely global, thematic, regional and national.

The challenges facing the incumbent indicator framework are multifaceted. Starting with quality measurement of equity is equally challenging. That involves gender equity, regional equity and of course the income equity. In the Indian context, we have to add one more and that is social category gap. Five of seven education targets deal with learning outcomes. That is effect of education on individual children, young people and adults.

Target 4.1 covers effective learning outcomes. Target 4.2 covers primary education and learning readiness as a learning outcome. Target 4.4 includes

relevant skills including technical and vocational skills for employment, decent jobs and entrepreneurship. Skills should include variety of skills including skills like communication skills, problem solving skills, critical thinking skills, creative thinking skills and finally employability skills. Target 4.6 covers literacy and numeracy. Target 4.7 covers knowledge and skills needed to promote sustainable development.

On goal specific means of implementation, Target 4.8 talks about effective learning environment. Target 4.c seeks to substantially increase the supply of qualified teachers. In the context of the 2030 agenda and education, investing in teachers would be one of the key strategies. The second most relevant strategy would be quality curriculum in the first place that takes care of the needs of inclusion and equitable education apart from skills. The declaration adopted clearly indicates that all students at all levels from pre-primary to higher education level should be taught by well-qualified and professionally trained, well motivated and well-supported teachers.

In terms of indicators on assessment of academic competencies of children in primary and secondary education we need to understand the statistical challenges and methods. We have been conducting learning assessment in India, grade 3, grade 5, grade 8 and grade 10. The National Achievement Survey being conducted by NCERT does this. A State level assessment takes care of Class 3, Class 5 and Class 8. Given India's statistical preparedness, India is well placed to comply with the global indicator framework in this regard.

On minimum proficiency measurement, the focus is only on school going children and hence does not cover children who are out of schools. This challenge need to be tackled and understood. Second is administration of a nationally representative learning assessment considerations of health, learning and psychosocial wellbeing needs to be accounted for. We need to discuss this and arrive at certain critical questions on this which can be captured either through the national family health survey or through something like MICS (the multiple indicator cluster survey). Moreover, no survey captures digital literacy skills that spread through formal and informal means and may not be directly linked with academic attainment.

Functional literacy is important since India is a country with more than 280 million illiterate adults and adult education continues to be important for India and hence conditions of lifelong learning are extremely important. To capture the above the frequency of most of our surveys and assessment reports must be made annual. Indicators measuring understanding of issues relating to global citizenship and sustainability talk about percentage of 15-year-old students in secondary school demonstrating atleast a fixed level of knowledge across a selection of topics in environmental science and geo-science.

Learning environment is a global indicator which we are collecting through U-DISE. It includes facilities like drinking water, single sex basic sanitation facilities, basic handwashing facilities, electricity, internet access, computers for pedagogical purposes and adapted infrastructure and materials for students with disabilities. Target 4c that indicates teachers, pre-primary, primary, lower secondary, upper secondary, meaning higher secondary who have received training, etc., are being captured in U-DISE. On equity, SDG 4 indicators need to capture not just national average or aggregate value of an indicator but also variation across different sections of the population. Individual characteristics such as sex, gender, wealth, location, rural/urban, social category or disability are important and we must aim at them. As mentioned in the beginning inclusion means access to success and therefore the emphasis should be on learning outcomes. And, learning outcomes can be achieved only through fostering quality education and with a special focus on teacher.

Annex

Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all: Targets and Indicators	
4.1 By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes	4.1.1 Proportion of children and young people: (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex
4.2 By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education	4.2.1 Proportion of children under 5 years of age who are developmentally on track in health, learning and psychosocial well-being, by sex
	4.2.2 Participation rate in organized learning (one year before the official primary entry age), by sex
4.3 By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university	4.3.1 Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex
4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship	4.4.1 Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill
4.5 By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations	4.5.1 Parity indices (female/male, rural/urban, bottom/top wealth quintile and others such as disability status, indigenous peoples and conflict-affected, as data become available) for all education indicators on this list that can be disaggregated
4.6 By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy	4.6.1 Percentage of population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills, by sex
4.7 By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development	4.7.1 Extent to which (i) global citizenship education and (ii) education for sustainable development, including gender equality and human rights, are mainstreamed at all levels in: (a) national education policies, (b) curricula, (c) teacher education and (d) student assessment
4.a Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all	4.a.1 Proportion of schools with access to: (a) electricity; (b) the Internet for pedagogical purposes; (c) computers for pedagogical purposes; (d) adapted infrastructure and materials for students with disabilities; (e) basic drinking water; (f) single-sex basic sanitation facilities; and (g) basic handwashing facilities (as per the WASH indicator definitions)
4.b By 2020, substantially expand globally the number of scholarships available to developing countries, in particular least developed countries, small island developing States and African countries, for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries	4.b.1 Volume of official development assistance flows for scholarships by sector and type of study
4.c By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries, especially least developed countries and small island developing States	4.c.1 Proportion of teachers in: (a) pre-primary; (b) primary; (c) lower secondary; and (d) upper secondary education who have received at least the minimum organized teacher training (e.g. pedagogical training) pre-service or in-service required for teaching at the relevant level in a given country

5
Gender Equality: Achievements, Gaps, Future Challenges and Implementation Framework to be adopted by India

Introduction

The signing of Millennium Declaration in 2000 meant commitment of the international community to eight Development Goals (the Millennium Development Goals or the MDGs) with time bound targets and measurable indicators. MDG 3 among them committed to "promote gender equality and empower women". The target for it included to "eliminate gender disparity in Primary and Secondary Education, preferably by 2005 and at all levels of education no later than 2015". This was operationalised as the ratio of girls to boys enrolment in primary schools, secondary and tertiary education. Three other indicators were added for: (a) female literacy, the ratio of literate females to males among 15-25 years olds, (b) non-agricultural wage employment and share of women in wage employment in the non-agricultural sector, and (c) political share in seats in national legislatures and proportion of seats held by women in national parliaments. This MDG and its targets and indicators have been rightly criticised as overly narrow (Buvinic *et al.*, 2008).

Considerable work has been done by scholars, experts and gender activists to unravel the issues of gender equality and women's empowerment which has been applied to see the experience, achievement and effect of MDG 3. Gender inequalities are multi-dimensional and the goals of 'gender equality' and 'women's empowerment' cannot be reduced to some single and universally agreed upon set of priorities. The issue of gender parity and empowerment was clearly stated in MDG3. But the MDGs were in fact too narrow and hence resulted in the obvious neglect of many other gender specific risks and vulnerabilities, roles and responsibilities, and power relations (Jhamb and Sinha, 2010).

The MDGs failed to explicitly articulate the social, political and economic context in which they were to be implemented at national and other levels. This was compounded by the gender-blindness of other MDG indicators and the invisibility of gender dynamics that cut across the goals in the policy dialogues (Jhamb and Sinha, 2010).

The indicators under Goal 3, namely non-agricultural wage employment and membership of national legislatures called attention to women's roles as producers and decision makers in the formal economy but even these indicators have been routinely overlooked in the policy framework when seeking to address issues of gender equality and women's empowerment (UNDP, 2003). Additionally there are also issues about the impact of such share and presence.

Gender parity in education, the share of women in wage employment and the proportion of seats held by women in national legislatures will be significant contributors for the achievement of gender equality and women's empowerment with each having the potential to bring about positive changes in women's lives. But there is no seamless correlation between these indicators and gender equality/women's empowerment. For instance, formal education alone may not automatically result in gender equality and empowerment. There

are gender-specific barriers to school attendance of girls and adolescents besides barriers they share with other groups in general. There is also limited routine use of gender-sensitive indicators. Enrolment does not necessarily reflect consistent attendance or completion or learning outcomes and quality for girls. But indicators to measure progress do not acknowledge the links between gender and quality of education. So while the goal of universal primary education (MDG 2) had been heralded as highly attainable, relative to other MDGs, there were gender-specific barriers to school attendance of girls and adolescents. Similar is the case with indicator 2 (access to paid work) and indicator 3 (political participation). This is also because these targets seek to capture the inputs and not link with outcomes and/or their impacts.

The socially ascribed burdens on women and socio-cultural dynamics limit female education and opportunities. There are institutional and implementation related impediments and also cultural norms and traditions which shape behaviour and stand in the way of attaining education levels and gender equality in ownership and control of resources. Prevailing attitudes and discriminatory laws and institutions act as barriers here.

The issues of Gender Equality and Women's Empowerment as included in MDG 3 and its targets and indicators and the relatively more comprehensive goal in SDG 5 and its targets and indicators, the still missing relevant crucial factors and gaps, lessons and challenges in the next 15 years are to be discussed against this background. We also take note of the performance of key Development Indicators in general and particularly its Human Development Index, Educational Index, Inequality adjusted Educational Index and Gender Inequality Index during 1999-2014 in different regions of the world and in India (Table 1).

This paper addresses them in Six Parts in which MDG 3 – its targets, achievements, best practices and gaps and SDG 5 and its proposed targets and indicators, implementation framework for the Indian State, financing, technical architecture for monitoring targets, indicators, evidence and lessons emerging from best practices, where possible, are sought to be addressed. This paper is organised as: Section 2 gives achievements under MDG 3 and the identified gaps that still remain. Section 3 discusses designing and adoption of SDGs. Section 4 discusses SDG 5 and targets and proposed indicators while the architecture for development and monitoring of SDGs, particularly SDG 5 is presented in Section 5. Finally, the way ahead and suggestions for action at India level are given in Section 6.

Table 1: Region-wise Performance on Key Development Indicators (1999-2014)

Regions	Human Development Index		Educational Index 1999	Inequality adjusted Educational Index 2014	Gender Inequality Index 2014
	In Year 1999	In Year 2014			
Arab States	0.64	0.68	0.62	0.33	0.53
East Asia and the Pacific	0.71	0.71	0.81	0.49	0.32
Europe and Central Asia	0.77	0.74	0.91	0.65	0.30
Latin America and Caribbean	0.76	0.74	0.83	0.52	0.41
South Asia	0.56	0.60	0.54	0.28	0.53
Sub-Saharan Africa	0.46	0.51	0.54	0.28	0.57
World	0.71	0.71	0.74	0.44	0.44
India	0.50	0.60	-	0.29	0.56

Source: Human Development Reports 2001 and 2015, UNDP.

Achievements under MDG 3 and Gaps

There have been national and international efforts to improve initiatives for gender equality and women's empowerment and their measurement and to identify what is needed to speed up countries' progress towards MDG 3. Buvinic *et al.* (2008) brought together these efforts at the midpoint between Declaration and 2015 and updates them. It is useful to look at this review to see the future action not only for MDGs but now for the SDGs.

The MDG framework tried to address what it considered at the time as the most pressing challenges facing women and girls such as increasing access to education for girls. It even delivered considerable, though not sufficient, progress on its gender-related goals. With the passage of time and benefit of hindsight, it has become clear that the framework did not do justice to the degree, range and complexity of challenges facing women on a daily basis, particularly the most marginalised women who have the least voice and agency.

On the three indicators of gender parity in school and tertiary education, women in non-agricultural wage employment and political participation in seats held by women in national parliament achievements were seen as given in Tables 3 and 4. But gender disparity in education continues and the target of eliminating it by the agreed date was not achieved. The issue of retention in schools and quality of education and levels of learning also arise. Achieving greater gender equality thus remains a long challenge despite the many gains in women's educational and employment outcomes which occurred in recent history.

Key indicators illustrate gender gaps in participation, attainment and performance in education as well as field of study. Thus in developing countries in 2008, 78 per cent of girls were enrolled in primary education vis-à-vis 82 per cent boys. Enrolment rates in primary education are more unequal in many developing regions. On the whole, countries in South Asia, Sub-Saharan Africa and North Africa and the Middle East show the poorest performance in terms of gender equality in participation in primary education. A survey of primary school attendance in 108 developing countries showed gender parity was reached in urban areas and among the richest 40 per cent of households, while girls in poor households and rural areas are more likely to be excluded (UN, 2010) .

MDG 2 aimed to achieve universal primary education had Target 5 to ensure that by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary education and indicators were net enrolment ratio in primary education, proportion of pupils starting Grade 1 who reach Grade 5 and literacy rate of 15-24 years olds. Achievement under this goal contribute to Goal 5 when seen with gender disaggregated data. Review of the position in India shows the position as discussed below.

Achieving Universal Primary Education in India

The overall increase in enrolment in India: The overall increase in enrolment in primary education during the period 2000-01 to 2013-14 was 18.6 million. The enrolment in primary education reached the highest level in 2011-12 (137.1 million) and then declined to 134.8 million in 2012-13 and to 132.4 million in 2013-14. Between 2011-12 and 2013-14, the total enrolment in primary education decreased by 4.7 million, with the enrolment of girls and boys decreasing by 2.5 million and 2.2 million, respectively. One of the reasons for the decline in enrolment in primary education is stated to be the declining child population age 0-6 years. The child population in the age group 0-6 years declined by 5.05 million between 2001 and 2011 (Census of India, 2001 and 2011).

The GER (Gross Enrolment Ratio) in primary education increased from 95.7 per cent in 2000-01 to 116.0 per cent in 2010-11 and then declined to 101.4 per cent in 2013-14. The overall increase in gross enrolment ratio in primary education during the period 2000-01 to 2013-14 was 5.7 per cent (from 95.7 per cent to 101.4 per cent). The GER for boys declined by 4.7 percentage points, while the GER for girls increased by 16.8 percentage points during this period.

It may be noted that Net Enrolment Ratio in Primary Education indicator is the ratio of the number of children of official school age (as defined by the national education system) who are enrolled in primary school to the total population of children of official school age. Based on the available data, the Net Enrolment Ratio (NER) in primary education (age

6-10 years) was estimated at 84.5 per cent in 2005-06 (Unified District Information System of Education – U-DISE). The NER increased to 88.08 per cent in 2013-14. The NER was higher for girls (89.26 per cent) than that for boys (87.2 per cent). The MDG India Country Report 2014 had quoted NER as 99.89 for 2010-11, based on DISE Flash Statistics 2011-12. The decline in NER in 2013-14 is attributed to the fact that, while calculating NER 2010-11, the projected 6-10 years child population was taken as 113.9 million in 2010-11 based on 2001 census (as per Office of Registrar General of India estimates) whereas the actual 6-10 years child population as per 2011 census was 130.9 million. Therefore, the GER and NER for 2011 and thereafter declined when calculated, based on actual child population as clarified by the Ministry of Human Resource Development.

The Age-Specific Enrolment Ratio (ASER)[1] for children of age 6-10 years was 93.11 per cent for the year 2013-14. The ASER was also higher for girls (94.36 per cent) than that for boys (91.97 per cent). But the census data of 2001 and 2011 in India show the continued gender gap in school attendance at the primary, secondary and tertiary levels as can be seen in Table 2. The gap has narrowed at the primary level but much less at higher levels. All these trends reflect the results of Government's push for enrolment which get reflected in enrolment at the lowest classes of primary level but, perhaps without a similar push and resources for retention and transition to higher classes, shows much less reduction in gender gaps at these levels.

In the two other indicators of political participation and non-agricultural wage employment also the gap has narrowed but continues and hence needs to be addressed (Tables 3 and 4). The number of women members increased from 8.11 per cent in Lok Sabha and 8 per cent in Rajya Sabha to 11.99 per cent and 10.40 per cent, respectively, from 2000 to 2014.

As we see, as per NSSO surveys, at all India level, the share of women in wage employment in non-agricultural sector was 20.23 per cent in 2004-05 vis-à-vis 16 per cent in 1999-2000. These figures underscore the challenge and the task ahead.

Designing and Adoption of SDGs

World leaders took a major step forward in agreement for achieving a sustainable future at the Rio+20 Conference on Sustainable Development in June 2012 in Rio de Janeiro, Brazil. The Rio+20 outcome document, "The Future We Want", set a mandate to establish an Open Working Group to develop a set of

Table 2: Gender Disaggregated Data on Education in India, 2001 and 2011 (School and Tertiary Education)

	Year	Males	Females
Percentage of population attending schools (Aged 6-14 yrs.)	2001	74.73	67.13
	2011	82.51	80.70
Percentage of population attending schools (Aged 15-19 yrs.)	2001	42.15	32.18
	2011	51.15	46.82
Percentage of population attending college (Aged 20-24 yrs.)	2001	11.12	5.95
	2011	57.99	59.98

Source: Census 2001 and 2011.

Table 3: Member of Indian Parliament by Gender, 2000-2014

	In Year 2000			In year 2014		
	Male	Female	Total	Male	Female	Total
Lok Sabha	498 (91.89%)	44 (8.11%)	542 (100%)	477 (88.01%)	65 (11.99%)	542 (100%)
Rajya Sabha	230 (92.00%)	20 (8.00%)	250 (100%)	224 (89.60%)	26 (10.40%)	250 (100%)

Source: Lok Sabha (www.loksabha.nic.in) and Rajya Sabha (www.rajyasabha.nic.in).

Table 4: Participation of Women in Wage Employment in the Non-agricultural Sector, 1999-2000 and 2004-05

(in percentage)

	1999-2000			2004-05		
	Rural	Urban	All India	Rural	Urban	All India
Share of women in wage employment in the non-agricultural sector	15.09	16.61	16	21.39	19	20.23

Source: NSSO.

Sustainable Development Goals. These goals build upon the Millennium Development Goals and converge the post-2015 development agenda into one global development agenda with sustainable development at its core. The SDGs share a universal common global vision of progress towards a safe, just and sustainable space for all human beings to thrive on the planet.

A process to agree on a new development agenda beyond 2015 involved two interconnected tracts – a 'Sustainable Development Goals' process and a post-2015 development agenda process. The two processes – the political – typically resulting in the goals and the technical – typically resulting in targets and indicators, leading to the formation of frameworks for internationally agreed development goals are different but inter-dependent. UN member states are expected to use the SDGs, universal set of 17 proposed goals, with 169 specific targets and indicators to frame their agendas and political policies over the next 15 years.

SDG 5: Targets and Proposed Indicators

To initiate the process defining the monitoring framework for the SDGs, the UN Statistical Commission (UNSC) at its 46th Session in March 2015 stressed that the development of a robust and high quality indicator framework is a technical process which requires time and needs to be conducted in stages, including the possibility of future refinements as knowledge evolves. The national statistical offices need to play the leading role in it to ensure national ownership. The existing regional mechanisms should also be used.

The following architecture for the development and monitoring of a global indicator framework was endorsed by the UNSC at its session in 2015.

- An Inter-Agency Expert Group on Sustainable Development Goal indicators (IAEG-SDG), comprising 28 representatives of NSOs and, as observers, regional and international organisations. The group was tasked with fully developing a proposal for a global indicator framework in an inclusive and transparent process.
- A High-level Group for Partnership, Coordination and Capacity-Building for Post-2015 Monitoring (HLG), comprising 15 to 20 NSO representatives and, as observers, regional and international organisations. The HLG will establish a global partnership for sustainable development data and provide strategic leadership for the SDG implementation process.

The 17 SDGs include SDG 5 to achieve gender equality and empower all women and girls. SDG 5 is both a cross cutting issue as well as a goal in its own right. Consequently, most of the general targets within SDG 5 overlap with targets in other goals that explicitly mention the gender aspect. But it has not been followed in operationalisation of the goal. Literally none of the six suggested targets under this goal are time bound, and hence not binding at all. Even worse, SDG 5 is the only goal that does not have a single time bound target.

The Sustainable Development Goals (SDGs) formulation has been a more open and more inclusive process than the formulation of the MDGs driven by United Nations Member States, and generating intense and wide debate. And yet, when it comes to gender justice, the goals sound eerily similar. MDG 3 committed to "Promote gender equality and empower women". SDG 5 calls to "Achieve gender equality and empower

Table 5: Targets and Indicators

Targets	Proposed Indicator	Comments
Target: 5.1 end all forms of discrimination against women and girls everywhere.	5.1.1 Whether or not legal frameworks are in place to promote, enforce and monitor equality and non-discrimination on the basis of sex.	The gender dimension will have to be separately seen even among different groups and communities. These will need to be supplemented by documentation of implementation/impact across geographical areas.
Target: 5.2 eliminate all forms of violence against all women and girls in public and private spheres, including trafficking and sexual and other types of exploitation	5.2.1 Proportion of ever-partnered women and girls aged 15 years and older subjected to physical, sexual or psychological violence by a current or former intimate partner in the previous 12 months, by form of violence and by age	Will have to address the problem of non reporting. Need of more inclusive programme support for encouraging them to break silence in this issue.
	5.2.2 Proportion of women and girls aged 15 years and older subjected to sexual violence by persons other than an intimate partner in the previous 12 months, by age and place of occurrence	
Target: 5.3 eliminate all harmful practices, such as child, early and forced marriage and female genital mutilations.	5.3.1 Proportion of women aged 20-24 years who were married or in a union before age 15 and before age 18	The issue relevant here is child marriage on which legal and social initiatives have been initiated.
	5.3.2 Proportion of girls and women aged 15-49 years who have undergone female genital mutilation/cutting, by age	This has not been a major issue in India but there are recent reports of the practice in some populations and areas and hence the action need.
Target: 5.4 recognise and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies, and the promotion of shared responsibility within the household and the family as nationally appropriate.	5.4.1 Proportion of time spent on unpaid domestic and care work, by sex, age and location	This is valuable target and indicators may be inadequate and therefore will need to be evolved with further discussion of experience. However the paid and unpaid care have to be separate not combined.
Target: 5.5 ensure women's full and effective participation and equal opportunities for leadership at all levels of decision making in political, economic and public life.	5.5.1 Proportion of seats held by women in national parliaments and local governments	Includes welcome addition of sub-national level elected offices. It does not of course take care of how much capacity they will have to stand for gender issues. In party based representation and with use of whips and anti defection law, it will have limitation in effectiveness in pursuing gender related issues.
	5.5.2 Proportion of women in managerial positions	

Table 5 continued...

Table 5 continued...

Target: 5.6 ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the ICPD and the Beijing Platform for Action and the outcome documents of their review conferences.	5.6.1 Proportion of women aged 15-49 years who make their own informed decisions regarding sexual relations, contraceptive use and reproductive healthcare	
	5.6.2 Number of countries with laws and regulations that guarantee women aged 15-49 years access to sexual and reproductive healthcare, information and education	
Target: 5.a undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources in accordance with national laws.	5.a.1 (a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure	Should be supplemented by per centage of girls who effectively used their rights and did not surrender in favour of parents or siblings.
	5.a.2 Proportion of countries where the legal framework (including customary law) guarantees women's equal rights to land ownership and/or control	
Target: 5.b enhance the use of enabling technologies, in particular ICT, to promote women's empowerment.	5.b.1 Proportion of individuals who own a mobile telephone, by sex	
Target: 5.c adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels.	5.c.1 Proportion of countries with systems to track and make public allocations for gender equality and women's empowerment.	As under Target 5.5 above.

all women and girls". Two important differences at this level are the explicit inclusion of girls, and of the word "all", which can be used to address the challenges faced by the most marginalised and oppressed. More differences appear at the level of the targets under the goal. Whereas MDG 3 had a single target focussed on education, SDG 5 proposes a range of targets to end discrimination, violence and harmful practices, recognise and value unpaid care work, participation and leadership in decision-making, and universal access to sexual and reproductive health and reproductive rights. These are welcome additions. However it is still to be seen how SDG 5 and its proposed targets finally translate into indicators, and whether these will be effective and usable for monitoring, since the experience of MDG 5 is not so encouraging.

Each SDG (as enunciated in the OWG's report) has its attached targets and means of implementation. Those linked to SDG 5 mention legal reforms and technology (5.a, 5.b and 5.c), but there is no reference about funding. It has been noted that the inadequacy of funding was a major weakness in the fulfilment of MDG 3. The challenge of funding SDG 5 seems therefore to be a major stumbling block unless it becomes central to its means of implementation which does not appear to be the case so far.

There are six targets under SDG 5 as we discuss below with total 16 indicators (5+3+2+2+1+3). Besides, three 5a, b and c which reflect means of implementation – legal reforms and technology. Although the focus of SDG 5 is ideal and essential for development, its

operationalisation leaves something to be desired. Many of the targets are of crucial importance (e.g. "eliminate all forms of violence against all women and girls"). These have long been agreed upon and can easily be captured by appropriate indicators. They are well-suited to have considerable impact, but they do not have a timeframe to make them binding especially for action and reporting. It is noted that of the 17 goals, SDG 5 is the only goal that does not have a single time bound target. So much for the commitments of the national and international community to gender equality and women's empowerment. The inclusion of time bound targets is indispensable if we want to track the progress of societies regarding such an important goal as the elimination of gender disparities. The targets and proposed indicators are discussed in Table 5 with comments on support, addition or issues of effectiveness.

The Way Forward

National and International environment has to be more supportive of women's voice and agency. Promoting the ability of women to articulate their views in a meaningful way (voice) and to become the agents of their own empowerment (agency) is essential in any initiative to help them to overcome engrained socio-cultural conditioning and the gendered division of labour. Empowerment requires a more comprehensive approach. This includes efforts to improve women's access to resources (e.g. credit, training, inheritance and land rights) and their capacity to use them (e.g. through anti-discrimination and gender-based violence legislation, gender-aware justice systems, and government mechanisms to improve gender equality).

Proactive measures are needed to combat policy evaporation – the dilution of gender equality commitments during policy implementation – and to ensure that a gender lens is used by all sectors. New modalities are also needed to give civil society groups working on gender equality, adequate resources and capacity strengthening support to facilitate their representation in policy dialogues. Innovative approaches are also needed to raise the awareness of the private sector on gender issues.

There is a need of renewed commitment to existing gender related frameworks including the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW) and the Beijing Platform for Action. These spotlight gender-specific issues that were largely invisible in the MDGs, but critical to their achievement and particularly new to the achievement of SDG 5 and other SDGs, such as gender-based violence, harmful traditional practices (e.g. child marriage), and the challenges female youth face in finding decent work. They underscore the accountability of national governments and the international community in putting resources and institutional mechanisms in place to achieve gender-based rights.

The main feature of MDG 3 and now SDG 5 of promoting gender equality and empowering women is that it challenges cultural norms and traditions and requires deep changes in day to day individual behaviour and practices, which are normally regarded as a "private matter". This is also the main challenge for implementation (Szekely, 2008). Changing the role of women and empowering them modifies household arrangements substantially which in many cases still not regarded as a desirable change for specific family members. Indentifying effective public policies for promoting gender equality is particularly difficult in the context of deeply entrenched traditions and cultural patterns. If the laws and mechanisms by which society operates and the underlying cultural patterns are not modified, policy will be swimming against the tide, making it difficult to identify efficient policy interventions to address gender disparities (ibid).

Szekely (2008) has identified three underlying elements which lead to the outcome of gender disparities:

- Cultural norms by which women are relegated to fulfilling certain roles within the household and in society, and through which they are excluded from a variety of activities and opportunities for human development and are reproduced generation after generation and become part of the 'normal' operation of societies.
- The rules of society – for instance, legislation (labour) may explicitly exclude women from or limit their access to certain activities.
- The mechanisms through which final outcomes are determined. Even in societies in which

cultural norms provide equal opportunities for women and the 'rules of the game' do not explicitly inhibit women's development, market mechanisms, such as the low returns to specific types of labour, including housework and other activities predominantly performed by women, undermine their development potential.

Progress towards gender equality and women's empowerment in the development agenda requires support for the women's movement to activate and energise the agenda. Empowerment requires agency along multiple dimensions. "Women's organisations… [as] key actors in pushing past distortions and development silos at all levels, and hence crucial to pushing the gender equality agenda forward. The politics of agenda setting influences funding priorities such that financial support for women's organisations and for substantive women's empowerment projects is limited" (Sen and Mukherjee, 2014).

In general progress in expanding women's opportunities has been less than in expanding women's capabilities. Efforts are needed for women to use their increasing capabilities in the economy and society. Better indicators are needed to measure progress towards gender equality, especially in economic participation.

- Gender equality requires changing underlying social norms in addition to observable outcome. One particularly promising approach to use financial incentives to change the behaviour of families towards girls and women, provided these are adequate and sustained. Conditional cash transfer programmes are one of the most interesting recent developments in demand side programmes to promote better educational and health outcomes – they function by using financial incentives to change the behaviour of families towards girl children and behaviour change often precedes and determines attitudinal or cultural change. But incentives should be adequate and sustained.
- Changes in laws, institutions and policies matter for scaling up gender equality objectives.
- Gender equality and women's empowerment are not synonymous and therefore cannot be tracked using a single indicator. Equality indicators measure women's status relatively to men's status and measures of equality can sometimes indicate equality of deprivation rather than equality of opportunity. Empowerment indicators measure changes in absolute levels of women's well being. These will include indicators of capabilities (education and health) and of opportunities (employment and political participation).
- The Indian Republic introduced policies and programmes for universalisation of elementary education, enhancing higher level education and also starting with the Constitutional provision of directive principle of State Policy in Article 45, Constitutional Amendment 2002 to make education as a Fundamental Right and enactment of RTE (Right to Education) Act, a number of initiatives were taken as we discuss here.

Sarva Shiksha Abhiyan (SSA), the principal programme of universalisation of primary education, has been implemented, as a centrally sponsored scheme in partnership with States/Union Territories (UTs) since 2000-01. Its overall goals are: (i) all children in school, (ii) bridge all gender and social category gaps at primary and upper primary stages of education, (iii) universal retention, and (iv) elementary education of satisfactory quality. It includes key programmatic thrusts for promoting girls' education.

In addition to programmatic interventions to promote girls' education within the mainstream elementary education system, girls' education is pursued through two special schemes, supported under SSA. These are:

(i) The National Programme for Education of Girls at Elementary Level (NPEGEL): The programme was launched in 2003 and was implemented in educationally backward blocks (EBBs), addressing the needs of girls who are 'in' and 'out' of school. Since many girls become vulnerable to leaving school when they are not able to cope with the pace of learning in the class or feel neglected by teachers/peers in class,

the NPEGEL emphasises the responsibility of teachers to recognise such girls and pay special attention to bring them out of their state of vulnerability and prevent them from dropping out. By the end of 2012-13, 41.2 million girls have been covered in 3,353 EBBs in 442 districts, 41,779 Model School Clusters have been established. At the cluster level, one school is developed into a resource hub for schools within the cluster.

(ii) **Kasturba Gandhi Balika Vidyalaya (KGBV) Scheme:** These are residential upper primary schools for girls from Scheduled Caste (SC), Scheduled Tribe (ST), Other Backward Classes (OBC) and Muslim communities and are set up in educationally backward blocks where schools are at great distances and are a challenge to the security of girls and often compel them to discontinue their education. The KGBVs reach out to adolescent girls who are unable to go to regular schools, out-of-school girls in the 10+ age group who are unable to complete primary school, and younger girls of migratory populations in difficult areas of scattered populations who do not qualify for primary/ upper primary schools. It is implemented in 27 States/UTs. Up to the year 2012-13, 3,609 KGBVs have been sanctioned and 366,500 girls were enrolled in these KGBVs as against the targeted enrolment of 373,000 girls.

The Rashtriya Madhyamik Shiksha Abhiyan is a flagship programme of Government of India, launched in March 2009, to enhance access to secondary education and improve its quality. The implementation of the scheme started from 2009-10 to generate human capital and provide sufficient conditions for accelerating growth and development and equity and also quality of life for everyone in India.

The Rashtriya Madhyamik Shiksha Abhiyan (RMSA), revised in 2013, has integrated among others, the Girls Hostel Scheme and National Incentive to Girls, specially to encourage girls in secondary level of education. A sum of Rs.3,000 is deposited in the name of eligible girls as fixed deposit. The girls are entitled to withdraw the sum along with interest thereon on reaching 18 years of age and on passing 10th class examination.

Mahila Samakhya (MS) Programme: The National Policy on Education (NPE) 1986, recognised that the empowerment of women is possibly the most critical pre-condition for the participation of girls and women in the educational process. The Mahila Samakhya programme was launched in 1988 to pursue the objectives of the National Policy on Education, 1986. It recognised that education can be an effective tool for women's empowerment. The main focus of the programmatic interventions under the MS programme has been on developing capacities of poor women to address gender and social barriers to education and for the realisation of women's rights at the family and community levels. The MS programme also involves setting up of Nari Adalats (women's courts) for addressing issues such as violence against women, among others. The evaluation of the MS programme has acknowledged Mahila Samakhya as a unique process-oriented programme which has demonstrated ways of empowering rural poor and marginalised women and thereby enabling their effective participation in the public domain and in educational and learning processes.

Saakshar Bharat Scheme: It was launched in 2009 and has been extended upto 31 March 2017. By end of September 2014, 388 districts in 26 States and one in UT were covered. About 3.92 crore learners appeared for biannual basic literacy assessment tests conducted so far. About 2.86 crore learners (including 2.05 crore females), comprising 0.67 crore SCs, 0.36 crore STs and 0.23 crore minorities have successfully passed the assessment tests under basic literacy conducted by National Institute of Open Schooling (NIOS), upto March 2014. In addition, about 41 lakh learners have taken up the assessment test held in August, 2014 and 1.53 lakh Adult Education Centres are functioning as of now. 2.5 million persons have been mobilised as Voluntary Teachers; 35 million primers in 13 Indian languages and 26 local dialects have been produced and distributed. Around 29 lakh learners have been benefitted under Vocational Training programme through Jan Shikshan Sansthan between 2009 to 2014 out of which the women beneficiaries were 25.02 lakhs.

Kishori Shakti Yojna and Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (RGSEAG) – 'SABLA': The Ministry of Women and Child

Development, Government of India, started in 2000 a scheme called "Kishori Shakti Yojna" (KSY) using the infrastructure of Integrated Child Development Services (ICDS). Kishori Shakti Yojana (KSY) seeks to empower adolescent girls, so as to enable them to keep charge of their lives. Thereafter, Nutrition Programme for Adolescent Girls (NPAG) was initiated as a pilot project in the year 2002-03 in 51 identified districts across the country to address the problem of under-nutrition among adolescent girls. Under the programme, 6 kg of free food grains per beneficiary per month are given to underweight adolescent girls. The two schemes have influenced the lives of Adolescent Girls (AGs) to some extent, but have not shown the desired impact.

Beti Bachao Beti Padhao: It has been launched on 22 January 2015 where the overall goal of the scheme is to celebrate the girl child and enable her education.

In 2005 enrolment in primary and upper primary classes together had a Gender Parity Index of 0.89 in India. In classes I-V it was 0.91 and in classes VI to VIII it was 0.83, this shows a lower gender parity in higher classes. In 2014-15 it was 0.94 for all classes and 0.93 in Classes I-V and 0.95 in Classes VI-VIII which shows a definite improvement (DISE data for 2005 and 2014-15).

The SDG 5 has now reflected the value of care and care giving and women's assumed special responsibility. The visibility and value of care and care-giving has increased now and care across the life-cycle is recognised as the joint responsibility of society and the state, rather than women alone but it has still to be clearly supported by public policy and programmes. Programmes of cash transfers and targeting cash payments to care givers support women's empowerment by increasing their control of resources and decisions within the household, but these can also reinforce women's traditional caring role and underestimate their time constraints.

Few programmes to date have answered the call for 'transformative' social protection that would address gender-specific risks and vulnerabilities, including discrimination and social exclusion, violence and time poverty. There is need of a re-focussed social protection agenda recognising intra-household inequalities, especially, decision-making power and the ownership of resources, the importance of social reproduction, including unpaid care-giving and household management, the diversity of family arrangements, and the distinct experiences of men and women in the labour market.

Gender equality and the empowerment of women and girls is both a cross-cutting issue as well as a goal in its own right. In order to account for the overlap of SDG 5 with the majority of the other SDGs, the suggestion of the UN Secretary-General's synthesis report that each target should only be considered achieved if it is met for all relevant income and social groups, which includes women, must be followed.

The fulfilment of SDG 5 and achieving the targets under it also mean that the concerned countries meet this commitment by achieving their national goals for women and girls. What they do nationally and sub-nationally is reflected in their monitoring and reporting for SDG. The issue of gender equality and women's empowerment being a cross cutting objective and requiring inter-sectoral action and initiatives (to address the challenges of traditions, cultures, the practices in private domain) will need a national plan of action with strong mechanism and funding and policy commitment for reforms and transformative approach. Similar plans and commitment are needed at state levels. The programmes particularly for right to education and universalisation of elementary education and support for education of girls, that have shown promise, need to be strictly implemented and monitored at regular intervals. Urban and rural local bodies in which women have 50 per cent claim on membership have to be given central role in supporting women's leadership at the grass root level upto the national level in order to ensure achievement of the SDG 5 targets. A crucial role will be of civil society organisations working on women issues who must be given role and responsibility as partners. Besides adequate funding which has not been a strong case so far, perseverance of policy direction will be essential.

Endnote

[1] Children of a specific single-age/age group, i.e. 6 to 10+ years or 11 to 13+ years, enrolled, irrespective of level of education, as a percentage of the population of the same single/age group.

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6
Sustainable Management of Water and Sanitation

Introduction

The phrase 'Water is life' is no cliché. The total volume of water on earth is about 1.4 billion cubic kilometer, of which freshwater is 2.5 per cent. One of every five people on earth faces water scarcity. As of 2012, 450 million people in 29 countries suffer from water shortages.[1] Water is essential for socio-economic development and for sustaining the ecology. Equity in access to water can be an issue within and across national boundaries and can be used as a tool for exercising power and control. The UN recognises access to safe drinking water and sanitation as human rights. Lack of access to water and sanitation especially impinges on the rights of children and women. Safe drinking water and sanitation are linked to good health and are key contributory factors behind under-nutrition and anemia in women.

Progress towards global food security continues to be slow, with around 800 million remaining undernourished[2] and around half of the world population suffering from different forms of malnutrition.[3] Food production requires critical inputs of water and agriculture already accounts for around 70 per cent of global freshwater withdrawals, in a world where some 0.9 billion people lack access to safe water[4] and where demand for water is expected to grow by 40 per cent till 2030.[5] Water demand for irrigation is expected to grow by 6 per cent in 2050 and is perceived as one of the main factors behind the increasing global scarcity of freshwater. Under the current circumstances, the water future appears bleak (see Box 1).

Global Call for Action

In 2000 the Member States of the United Nations signed the Millennium Declaration which subsequently rolled the Millennium Development Goals (MDGs). Goal 7, to ensure environmental sustainability, included a target – Target 10 – that challenged the global community to halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.

The WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation (JMP), which began monitoring the sector in 1990, has provided regular estimates of progress towards the MDG targets, tracking changes over the 25 years to 2015. In 1990, global coverage of the use of improved drinking water sources and sanitation facilities stood at 76 per cent and 54 per cent, with respective MDG targets of 88 per cent and 77 per cent by 2015 (see Annex 1 for definitions). The challenges were huge: Global figures hid vast disparities in coverage between countries and within, many of which were battling poverty, instability and rapid population growth. Sanitation was also not high on the political agenda.[6]

Monitoring of progress helped identify future priorities to be addressed in the Agenda 2030. What is abundantly clear is that despite significant progress in water and sanitation, much remains to be done, and groups working on water and sanitation were greatly relieved when Goal 6 was proposed as an independent SDG.

Over the years the importance of providing focussed attention to water and sanitation from a larger perspective, including, and way beyond drinking water and sanitation was increasingly becoming imperative. Eventually Goal 6 suggests to ensure availability and sustainable management of water and sanitation for all.

Making the Case

The Rio+20 processes for developing the SDGs recognised the importance of water and sanitation. The linkages between water and a green economy, and provisioning of safe drinking water supplies and adequate sanitation services for poverty eradication were spelt out. The need to address inequities in access to water, which is closely linked to food and energy security, was stressed. The water thematic consultations set a new course for concerted action and global direction, capturing water's importance to the post-2015 development framework, recognising: (a) Water as a key determinant of social, economic and environmental development, requiring a central focus of any post-2015 framework for poverty eradication and global sustainable development; (b) Water, sanitation and hygiene, water resources management and wastewater management and water quality as indispensable elements for building a water secure world; (c) Global importance of water security; (d) Key roles of governments and cooperation at different levels and with different stakeholders; and, (f) Need for implementation of innovative, inclusive and sustainable financing.[7] The intrinsic linkage between women and girls and water and sanitation could also no longer be ignored.

MDG 7, Target 10: Global Progress Update

The progress on achievements relating to Target 10 of MDG 7 has been mixed:

1. **There have been huge gains in access to drinking water:** Some 2.6 billion people have gained access to an improved drinking water source since 1990, and 91 per cent of the global population now uses an improved drinking water source compared to 76 per cent in 1990. These gains happened as the world's population increased by 2 billion people from 5.3 billion in 1990 to 7.3 billion in 2015. An improved drinking water source is defined as one that is protected from outside contamination.
2. **Progress on sanitation has been slow:** One third of the world's population (2.4 billion people) still does not have access to an improved sanitation facility, one that separates human waste from human contact. Almost a billion people (946 million) do not use any sanitation facility and defecate in the open. Open defecation contaminates the environment affecting entire communities and has been linked to childhood stunting. While 147 countries met the drinking water target, only 95 were able to meet the sanitation target.
3. **Progress has been uneven:** Where you live makes a difference, as do income levels. Nine out of ten people practicing open defecation and eight out of ten people without an improved drinking-water source live in rural areas. People living in sub-Saharan Africa and Southern Asia are particularly disadvantaged, even more so if they are poor. Meanwhile, almost all developed countries have universal access to drinking water and sanitation.

Box 1: Our Water Future

By 2025, 1.8 billion people will be living in regions or countries with absolute water scarcity. Given the trans-boundary nature of water, this has implications for world peace and equitable socioe-eonomic development.With 263 trans-boundary river basins in the world, the potential for cooperation – or conflict – is tremendous.

While food output must grow by 60 per cent to feed 9 billion by 2050, by 2030, the world will confront a water supply shortage of 40 per cent.

India's demand for food is estimated to be 578 metric tonnes (Mt) in 2025 and 713 Mt in 2050. By 2050, India will need to feed 1.6 billion, with increasing resource constraints, in a more unpredictable climate. The water demand across various sectors in 2010 was pegged at 813 billion cubic metres (BCM) and estimated to increase to 1,093 BCM in 2025 and 1,447 BCM in 2050. Agriculture accounts for 80 per cent of water consumption, 70 per cent of which comes from groundwater. Estimates indicate that by 2050 under the business as usual scenario, India will be staring at a 50 per cent gap between demand and supply.

In early 2015, the World Economic Forum recognised the water crisis as one of the top three global risks.

Source: Barthakur, R. and I. Khurana (eds). 2015. *Reflections on Managing Water: Earth's Greatest Natural Resource*, Balipara Foundation.

4. **Data have been crucial to measuring advances and revealing insights:** The WHO and UNICEF Joint Monitoring Programme (JMP) has monitored progress on access to water and sanitation since 1990. It also presented data that brought to light inequalities between various groups, including urban and rural residents, the gender burden of water collection, and the persistent exclusion of the poor from water and sanitation services. Robust and disaggregated data, insightful analysis and compelling presentation will be crucial as we transit to the SDGs and work towards a future where no one is left behind.[8]

Key Messages

- The global target for drinking water was met by 2010, but 665 million people still lack access to improved drinking water sources.
- The global MDG target for sanitation has been missed by almost 700 million people. In 2015, 2.4 billion people still lack improved sanitation facilities.
- The least developed countries did not meet the sanitation target, and only 27 per cent of their current population has gained access to improved sanitation since 1990.
- The 31 per cent reduction in open defecation in India alone represents 394 million people, and significantly influences regional and global estimates.

MDG 7, Target 10: Achievements in India

The sheer size of India and its diversities are serious challenges to contend with while securing affordable, equitable and sustainable access to safe drinking water and sanitation. The sheer number of people who benefit even with a percent increase is significant.

Based on the Millennium Development Goals, India Country Report 2015, highlights include:

Drinking Water

During 2012, 87.8 per cent households had access to improved source of drinking water: 86.9 per cent households in rural and 90.1 per cent households in urban areas had access to improved source of drinking water. The target of halving the proportion of households without access to safe drinking water sources from its 1990 level to be reached by 2015, was thus already achieved in rural areas and was likely to be achieved in urban areas.

Sanitation

The 31 per cent reduction in open defecation in India alone represents 394 million people, and significantly influences regional and global estimates. But, over 770 million people do not have access to sanitation.

At all India level, the MDG target is unlikely to be met. The percentage of households without sanitation facility is likely to be 47.31 per cent vis-a-vis the target of 38.09 per cent.[9] India has large gaps in relation to sanitation coverage and economic status.[10]

For drinking water, the concerns are centered on the following:

a) Definition of coverage and water quality: The category 'improved drinking water sources' under the MDG definition (see Annex 1 for definitions) includes sources that, by nature of their construction or through active intervention, are protected from outside contamination, particularly faecal matter. It comprises piped water on premises such as piped household water connection located inside the user's dwelling, plot or yard. Other improved drinking water sources include public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs and rainwater collection.

Thus, the definition of coverage as per the MDGs focusses on some anthropogenic causes of water contamination 'external water quality issues,' such as microbial contamination and use of agrochemicals and not 'internal.' For example, chemical contaminants such as fluoride, arsenic and nitrate are not covered.This raises questions about the safety of these sources. In August 2015, the Union Minister for Water Resources provided the following information to a question in the Lok Sabha on drinking water quality (see Table 1), which indicates that some 3.8 crore people are affected by chemical water quality issues. These contaminants will need to be taken into account to achieve target 6.1.

b) Sustainability of drinking water sources and systems: Drinking water supply schemes are developed and funded only to be rendered useless due to drying

up of sources or lack of operation and maintenance. Thus, in spite of considerable investment over the years, covered habitations continue to 'slip back' and need reinvestment. Reasons behind this include over-dependency on groundwater for multiple uses which deplete drinking water sources and inadequate efforts at recharging these sources.

Table 1: Number of Habitations Affected by Drinking Water Quality Issues

Parameter	Habitations	Population
Fluoride	12,727	97,07,658
Arsenic	1,800	22,32,818
Iron	34,096	19,452,362
Salinity	15,617	47,66,801
Nitrate	2,521	27,07,287
Total	66,761	38,866,926

Source: Question raised in Lok Sabha on contaminated drinking water, 23 July 2015, available at: http://admin.indiaenvironmentportal.org.in/data-statistics/question-raised-lok-sabha-contaminated-drinking-water-23072015.

While drinking water supply is accorded priority in terms of allocation, this is seldom the case, especially when demand exceeds supply. Given that securing domestic water is largely a women's responsibility, the search for arranging domestic water has gender implications and increases the work burden on women and the girl child.

c) Effects of climate change: Ample evidence indicates the impact of climate change on the water cycle and increased episodes of drinking water crises. Droughts and floods take their toll on quantity and quality of drinking water available, and on the people. In 2009, migration from Bundelkhand region increased due to shortage of drinking water as a result of three successive droughts.[11] Between 1801-2002, India experienced 42 droughts.[12] Access to safe drinking water is a challenge during floods and efforts to meet the needs come at a cost. Locally available solutions can be found to address this in keeping with Target 6.b.

From MDGs to SDGs: The Challenges Ahead

Goal 6 of the SDGs is much broader and more ambitious than the MDG 7, Target 10. While the latter was more focussed on drinking water and sanitation, SDG 6 is overarching and more holistic. This is an essential requirement from the equity and sustainability point of view.

The other challenge is going to be around defining and building consensus around the indicators for monitoring progress. This is work in progress and will involve harmonising these indicators with national indicators. Monitoring will have financial implications as well. As a signatory to the SDGs, India must achieve this Goal. A well-defined strategy is imperative. India needs to take a comprehensive view of water, to get the complete picture, acknowledge it and own it (see Box 2).

Programmes in India

Several Acts, policies, programmes and guidelines under various Ministries relate to Goal 6 and can play a major role in its achievement. Table 2, though not comprehensive, gives an idea of these programmes.

Sanitation Programmes

Provisioning of drinking water and sanitation services are constitutionally recognised as the responsibility of the states. Union Government programmes have played a significant role in increasing access to sanitation facilities, especially in rural areas where the dependence on public provisioning of essential services is relatively higher than that in urban areas.

The introduction of the Central Rural Sanitation Programme in 1986 and its revamping as Total Sanitation Campaign (TSC) in 1999, helped increase the coverage of household toilets in rural areas from 1 per cent in 1981 (Census 1981) to 22 per cent in 2001 (Census 2001) and 32.7 per cent in 2011 (Census 2011).

Subsequently, the Nirmal Bharat Abhiyan (NBA) in 2012, which succeeded TSC, aimed to accelerate sanitation coverage in rural areas to achieve the vision of 'Nirmal' Bharat by 2022 with all Village Panchayats in the country attaining 'Nirmal' status.

Box 2: Water Snapshot – the Gaps in India

If India plans to achieve the SDGs, then the points mentioned below give an indication of the challenges and the areas requiring concerted action.

- A complete database on India's water resources does not exist and consensus on utilisable resources available is lacking. The volume of utilisable water available annually needs to be agreed upon for subsequent allocation.
- Water is required for food production, domestic use, industrial purposes, energy production, and to maintain ecological flows. Allocations must be based on the principles outlined in the SDG framework and the commitments agreed upon under SDG 6.
- India may soon move to a water stressed state despite being home to the perennial Himalayan and Peninsular rivers. Increasing demand across various sectors and a rapidly changing climate has exacerbated the problem. Serious efforts are required for water management that can help alleviate the effects of climate change.
- Agricultural sector gets the lion's share of freshwater allocation - around 80 per cent. Efficiency of water use in India is lower than several other countries and provides an opportunity to reduce use. Such reduction measures will contribute towards achieving Target 6.4.
- Groundwater is a major source of water, leading to its over-exploitation, even in mining. India is the largest extractor of groundwater in the world.
- Estimates indicate that by 2050 ten of the major river basins will see a groundwater abstraction of more than 75 per cent. This depletion leading to water scarcity will need to be addressed to achieve Target 6.5.
- Pollution from the discharge of untreated waste water threatens freshwater safety. Biological, organic and inorganic pollutants contaminate almost 70 per cent of surface water resources and a growing percentage of groundwater reserves. Only 21 per cent of the municipal sewage is treated in India. The remaining is disposed into waterbodies untreated resulting in pollution of rivers. Achieving Target 6.3 will require a serious relook at the current causes of water pollution and practical measures that can prevent and address this.
- As many as 19 states face groundwater contamination. Geogenic contaminants have affected groundwater in over 200 districts, and have emerged as a problem due to excessive withdrawal of groundwater.
- Floods affect over 3 million Indians annually. India is the second most flood-prone country in the world. Increased frequency of urban flooding, primarily due to rapid and unplanned urbanisation is an emerging problem, further putting pressure on drainage systems.
- Between 1801-2002, India experienced 42 droughts. A large part of the country (68 per cent) is prone to drought. The situation is exacerbated due to deforestation, groundwater extraction and poor land and water management. Droughts take an economical, social and environmental toll.
- The diverse ecology of India is replete with examples of successful improved land and water management with the involvement of the local population. Such efforts need to be upscaled within the country to achieve Target 6.4. Knowledge of these practices can be shared with other countries in the spirit of achieving Target 6.a.

Source: Barthakur, R. and I. Khurana (eds). 2015. *Reflections on Managing Water: Earth's Greatest Natural Resource,* Balipara Foundation.

The Swachh Bharat Abhiyan (SBA), launched on 2 October 2014, aims to ensure access to sanitation facilities (including toilets, solid and liquid waste disposal systems and village cleanliness) and safe and adequate drinking water supply to every person by 2019, three years ahead of the deadline set by NBA (though NBA focussed only on sanitation with the National Rural Drinking Water Programme covering drinking water in rural areas).

Under the Swachh Bharat Abhiyan there are two missions, the Swachh Bharat Mission (Rural) and the Swachh Bharat Mission (Urban).The sanitation programmes aim to address sanitation issues beyond toilet and include solid and liquid waste management as well.

Financial Implication of SDG 6 for India

It is difficult to arrive at a complete figure relating

Table 2: Linking SDG 6 with Ongoing Water and Sanitation Programmes in India

Targets	Description	Act/Programme/Policy/Guideline
6.1	By 2030, achieve universal and equitable access to safe and affordable drinking water for all.	National Rural Drinking Water Programme; Accelerated Urban Water Supply Programme
6.2	By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.	Swachh Bharat Abhiyan, Swachh Bharat Mission (Swachh Bharat Mission - Rural and Swachh Bharat Mission - Urban); Solid and Liquid Waste Management (SWM) Guidelines (rural); SWM (urban); Guidelines for household toilets, community toilets, public toilets
6.3	By 2030, improve water quality by reducing pollution, eliminating dumping and minimising release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.	Namame-Gange, The Water (Prevention and Control of Pollution) Act, 1974
6.4	By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.	Guidelines for improving use efficiency in irrigation, domestic and industrial sectors
6.5	By 2030, implement integrated water resources management at all levels, including through trans-boundary cooperation as appropriate.	National Water Policy; international water treaties and signing of 11 MoUs (Australia, Bahrain, Cambodia, China, Fiji, Iran, Iraq, Rwanda; Bilateral cooperation with Bangladesh, Bhutan, China, Nepal, Pakistan)
6.6	By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	Namame-Gange, Desert Development Programme, Drought Prone Areas Programme
6.6a	By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.	SAARC; Africa-India Framework for Cooperation, SACOSAN (South Asia Conference on Sanitation)
6.6b	Support and strengthen the participation of local communities in improving water and sanitation management.	Water policy, National Rural Drinking Water Programme

Note: As on December 2015.

Source: Compiled by author.

to achieving SDG 6, since it includes aspects of: (a) Sustaining water and its ecosystems, (b) Sustaining water supply for different sectors in rural and urban areas, (c) Managing transboundary issues, (d) Addressing drought and floods, (e) Climate change mitigation, and (f) Sanitation, including safe disposal of human waste and solid and liquid waste management.

As an implementation strategy it is important to arrive at this figure and identify sources of funding.

The allocation for rural drinking water in central Budget 2015-16 was Rs 2,611 crore, down from Rs. 9,250 crore allocated in 2014-15.[13] According to the Minister of Drinking Water and Sanitation under the devolution of funds as per the recommendations of

the 14th Finance Commission, "Rs. 2 lakh crore-plus would be going to gram panchayats. These funds should also be utilised at least for drinking water purposes".[14]

The unit costs for toilets have been enhanced for Individual Household Latrines (IHHLs) (from Rs. 10,000 to Rs. 12,000), school toilets (from Rs. 35,000 to Rs. 54,000), anganwadi toilets (from Rs. 8,000 to Rs. 20,000) and Community Sanitary Complexes (CSCs) (from Rs. 2,00,000 to Rs. 6,00,000). Funding for these new initiatives will be through budgetary allocations, contributions to the Swachh Bharat Kosh and through commitments under Corporate Social Responsibility (CSR) and will come with 100 per cent tax exemptions for construction of toilets and for cleaning up of the Ganga.[15]

Union Urban Development Minister stated that the government proposes to spend Rs. 1.34 lakh crore to construct toilets (11.11 crore toilets in rural areas) and about Rs. 62,000 crore will be spent in 4,041 cities. In addition, 2.47 lakh panchayats will be given Rs. 20 lakh each for the next five years to keep their villages clean.[16]

Challenges for effective implementation of the programme include the reduction in the budget of the Information Education and Communication (IEC) component (from 15 per cent to 8 per cent), critical to trigger behavioural change to ensure usage of toilets and the lack of resources for maintenance of school toilets and community sanitary complexes could result in rapid deterioration and subsequent non-usage of these over time, severely impacting the sustainability of the programme.[17]

From Intention Towards Implementation

The SDGs offer a historical opportunity for sustainable and equitable water and sanitation management. However, challenges need to be recognised, acknowledged and then worked upon for finding sustainable solutions for achieving SDGs. Some of these include:

- Taking a realistic stock of resources (water for example),
- Defining and harmonising coverage definitions,
- Developing an implementation strategy and action plan,
- Building good robust monitoring frameworks that capture outcomes and build in transparency and accountability,
- Financing the Goal and its operation and maintenance, and
- Stakeholder engagement.

Water

In terms of water resources per se, one of the biggest challenges is that consensus on the actual water available in India continues to elude us. There are differences in estimates regarding the total utilisable water available, and future demand projections. The Ministry of Water Resources (MoWR) states the total utilisable water to be 1,123 Billion Cubic Meters (BCM). Other estimates put it at 634 BCM. Unless there is scientific consensus on the extent of the resources available, their appropriate management will be next to impossible.[18]

The country is rapidly drying up as groundwater and surface waters are being mined to unsustainable levels and the per capita availability of water is declining. Per capita availability declined from 2,209 cubic meters in 1991 to 1,820 in 2001 and 1,545 in 2011. Trends indicate that India will move into water stressed state by 2025, when the per capita availability will further decline to 1,341 cubic meters.[19]

The opportunity could not be more favourable, and the time more right. Some of the options that could help in achieving SDG 6 are given below:

a) Know the water resources: Effective planning and allocation of water across various sectors is possible only if the resources available are known with a fair degree of accuracy. The first step towards implementing the SDG 6 is to arrive at a consensus figure on the water resources available.

b) Inform and involve people and celebrate water: Re-establish the relationship between people and water. An integral part of religion, culture, art, tourism and celebrations, restoring the connection between people and water can work wonders. To quote a Chinese proverb, 'When you drink the water, remember the spring and this can only happen if you involve the people.'

c) Uphold principles of equity and sustainability: Lack of water creates an environment of unrest and conflict. To quote a Turkish proverb, 'When one man drinks while the other can only watch, dooms day follows.' Act on the equity principles calls for a mix of raising awareness, financial allocations, specific programmes, monitoring and evaluation of access and prudent water resource allocations. Above all it calls for a change in mindset and commitment towards water and its access for all.

d) Create water banks: In spite of increasing instances of erratic monsoon, capturing rain where and when it falls helps replenish depleted resources, address drought and also reduce episodes, duration and intensity of floods. Rainwater harvesting and artificial groundwater recharge serve dual purposes: absorbing excess water and releasing it when required. India has rich heritage of water harvesting systems that are being revived with suitable adaptations to the contemporary environment and a huge scale up of these could bridge the water gap.[20]

e) Achieve breakthroughs through technology and innovation: While technological solutions alone often lead to a new set of problems, technological breakthroughs can work wonders. For this, innovation is key. India can learn lessons from Israel which is known as the water startup capital. Innovation in India needs to be nurtured and awarded. For instance, the US based X Prize Foundation, best known for hosting global-scale competitions that drive innovation will launch the Indian edition of the contest with a minimum cash prize of Rs. 10 crore for ventures offering solutions in the area of water scarcity and sustainability.[21]

f) Bring efficiency in water use across all sectors: In Israel, every drop of fresh water is used twice. While India is known for its innovation in agriculture, much more can be done. Drip irrigation has not really caught on in spite of government incentives. A relook at how to promote drip irrigation to bridge gaps is required. Scaling up of water saving technologies such as sustainable rice intensification (SRI), appropriate crop planning and use of soil sensors to gauge soil moisture prior to irrigation are but few examples of how water use in agriculture can be reduced. A water responsive industry is also required. While some industrial houses are exhibiting water responsive behaviour by undertaking water audits and finding solutions to reduce the water footprint along the production line, the practice needs to amplify. Approaches such as cradle to cradle approach, and a supply chain water strategy need to be scaled up.

g) Use wastewater: While this has been on the agenda for decades now, the examples remain in isolated pockets. This needs to change and water needs to be recycled and reused wherever possible. To do this appropriate incentives are required.

Sanitation

Sanitation no longer lacks political determination. Sanitation has been an integral part of the Prime Minister's election campaign and addresses to the nation. In a bid to invite corporate funds, the Government through the budget announced in 2015 that corporate contributions under this initiative will be counted as CSR expenditure.

While working towards the sanitation-related targets, it is important to focus on not only numbers but usage.Though crores of toilets need to be constructed, coverage is not the end of the story. Sanitation is about usage and research reveals that the two have rarely matched. Diving deeper to understand poor usage has revealed the complexity of issues involved. Some of the factors that emerged include the following:

a) Behaviour aspects around sanitation and bringing about change,

b) Construction quality,

c) Availability of water,

d) Absence of end-to-end total solutions,

e) Poor supply chains,

f) Leaving out to the last person, and

g) Poor flood resilience of infrastructure.

Finally, the SDGs offer a tremendous opportunity for India to accelerate its determination towards being water secure, clean and a healthy nation. India is known for its innovation and programmes that address specific challenges. It also offers India a platform to emerge as a powerful player on the international stage, to share its knowledge and experience as a learning partner. Clearly, an opportunity not to be missed.

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Annex 1: Definitions of Coverage (MDG)

1. Improved drinking water sources include sources that, by nature of their construction or through active intervention, are protected from outside contamination, particularly faecal matter. It comprises piped water on premises such as piped household water connection located inside the user's dwelling, plot or yard. Other improved drinking water sources include public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs and rainwater collection.
2. Unimproved drinking water sources include unprotected dug wells, unprotected spring, cart with small tank/ drum, tanker truck, and surface water (river, dam, lake, pond, stream, canal, irrigation channels), bottled water.
3. Open defecation include defecation in fields, forests, bushes, bodies of water or other open spaces, or disposal of human faeces with solid waste.
4. Unimproved sanitation facilities include facilities that do not ensure hygienic separation of human excreta from human contact. Unimproved facilities include pit latrines without a slab or platform, hanging latrines and bucket latrines.
5. Shared sanitation facilities include sanitation facilities of an otherwise acceptable type shared between two or more households. Shared facilities include public toilets.
6. Improved sanitation facilities include facilities that ensure hygienic separation of human excreta from human contact. They include:
   - Flush or pour-flush toilet/latrine to piped sewer system, septic tank, pit latrine,
   - Ventilated improved pit (VIP) latrine,
   - Pit latrine with slab, and
   - Composting toilet.

Source: Indicators and a Monitoring Framework for the Sustainable Development Goals: Launching a data revolution for the SDGs. Sustainable Development Solutions Network. Available at: http://unsdsn.org/wp-content/uploads/2015/03/150320-SDSN-Indicator-Report.pdf

Annex 2: Linking SDG 6 to the Principles of the SDG framework

People: We are determined to end poverty and hunger, in all their forms and dimensions, and to ensure that all human beings can fulfil their potential in dignity and equality and in a healthy environment.

Drinking water and sanitation are the foundation of socio-economic development. Involvement of people in the planning, implementation, usage and monitoring of policies and programmes can address challenges based by different stakeholders.

Planet: We are determined to protect the planet from degradation, including through sustainable consumption and production, sustainably managing its natural resources and taking urgent action on climate change, so that it can support the needs of the present and future generations.

Steps must be taken to ensure that we leave adequate water for the natural resources on the planet, including water, its ecosystem and biodiversity.

Prosperity: We are determined to ensure that all human beings can enjoy prosperous and fulfilling lives and that economic, social and technological progress occurs in harmony with nature.

Ample evidence is available on the linkage between access to water and sanitation and socio-economic growth. Mismanagement of water can result in drought and flooding, perpetuating poverty, imposing huge burden on the State's resources and destroying nature.

Peace: We are determined to foster peaceful, just and inclusive societies which are free from fear and violence. There can be no sustainable development without peace and no peace without sustainable development.

Water has been the driver of several conflicts and this situation needs to change as water being the driver of peace.

Partnership: We are determined to mobilise the means required to implement this Agenda through a revitalised Global Partnership for Sustainable Development, based on a spirit of strengthened global solidarity, focussed in particular on the needs of the poorest and most vulnerable and with the participation of all countries, all stakeholders and all people. The interlinkages and integrated nature of the Sustainable Development Goals are of crucial importance in ensuring that the purpose of the new Agenda is realised

Partnerships based on the principles of equity can facilitate knowledge exchange, foster innovation and build capacity in the water and sanitation sector.

Source: Author's perspectives.

Annex 3: Linkage of SDG 6 with Other Goals

Goal No	Goal	Linkage with Water and Sanitation
1	End poverty in all its forms everywhere	Access to safe drinking water and sanitation exacerbates poverty. Water poverty has a direct linkage with economic poverty since water is an essential input into livelihood option.
2	End hunger, achieve food security and improved nutrition and promote sustainable agriculture	Globally more than 70 per cent of water use is for agriculture. Efficiency in use enhance sustainability of agricultural options. Hidden hunger and nutrition depend on safe drinking water and adequate sanitation so that the food ingested is absorbed.
3	Ensure healthy lives and promote well-being for all at all ages	Lack of access to safe drinking water and sanitation has morbidity and mortality implications and are responsible for a high percentage of the death of children under five.
4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	A lack of safe drinking water and sanitation facilities in schools and other learning institutions affects attendance and the health of the students, specially of the girl child, women and persons with disabilities.
5	Achieve gender equality and empower all women and girls	Enabling easy access to water facilities and sanitation facilities reduces the work burden of girls and women. Women face risk of sexual violence while defecating in the open and access can reduce risk.
7	Ensure access to affordable, reliable, sustainable and modern energy for all	Energy and water are dependent on each other. Water is required for modern energy production (micro hydels for example) and energy is required for water extraction, storage, treatment and distribution.
8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	Economic growth for all is dependent on the availability of adequate water required for economic opportunities. Drought often leads to migration and compulsion for working in less than adequate work environments.
9	Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation	Water supply assets and systems created should be resilient to natural disasters. Sustainable and inclusive industrialisation is depended on a water responsible industry.
10	Reduce inequality within and among countries	Sharing of trans-boundary waters – surface and groundwater should be on principles of equity and sustainability. Countries should also control pollution of these resources.
11	Make cities and human settlements inclusive, safe, resilient and sustainable	Inclusive water distribution, effective water and sewerage management, safe and adequate drinking water and sanitation facilities.
12	Ensure sustainable consumption and production patterns	Reducing water footprint in production processes and reuse of water facilitates sustainability.
13	Take urgent action to combat climate change and its impacts*	Effective water management for flood and drought mitigation.
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	Controlling pollution due to agriculture , industry and domestic wastewater helps conserve marine resources.
15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	Natural resources are interdependent on each other.
16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	Water for peace should be the new mantra. The accountability of institutions responsible for facilitating and providing water and sanitation for all promotes peace and justice
17	Strengthen the means of implementation and revitalise the global partnership for sustainable development	Cross learning of knowledge and innovation, supporting capacity enhancement and technology transfer in the water and sanitation sector can accelerate access and enhance sustainability

Note: * Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global response to climate change.

Source: Compiled by author.

Goal 6: Ensure availability and sustainable management of water and sanitation for all: Targets and Indicators	
6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all.	6.1.1 Proportion of population using safely managed drinking water services
6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations.	6.2.1 Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water
6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimising release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.	6.3.1 Proportion of wastewater safely treated 6.3.2 Proportion of bodies of water with good ambient water quality
6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity.	6.4.1 Change in water-use efficiency over time 6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources
6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.	6.5.1 Degree of integrated water resources management implementation (0-100) 6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation
6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes.	6.6.1 Change in the extent of water-related ecosystems over time
6.a By 2030, expand international cooperation and capacity-building support to developing countries in water-and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies.	6.a.1 Amount of water-and sanitation-related official development assistance that is part of a government-coordinated spending plan
6.b Support and strengthen the participation of local communities in improving water and sanitation management.	6.b.1 Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management

7
Where are we on the Missing MDG – Energy?

Introduction

The Millennium Development Goals (MDGs), adopted by 189 countries in the year 2000 at the Millennium Summit of the United Nations, comprised a set of eight development goals and 18 corresponding targets primarily aimed at reducing extreme poverty in developing countries. The eight goals, each with time-bound and quantifiable targets, with a deadline of 2015, endeavoured to address multiple socio-economic and environmental objectives.

Energy has often been referred to as the "missing MDG"![1] This is because neither has there been any explicit mention of energy related goals or targets in the MDGs, nor has it found any clear reflection in the efforts of governments to achieve MDGs subsequently.[2] The MDG that came closest in terms of the potential to encompass aspects of access to energy under its ambit was MDG 7, i.e. "Ensure Environmental Sustainability". Nonetheless, even MDG 7 did not include any explicit target on energy. What it did, however, was to include a rather generic target of 'integrating the principles of sustainable development into country policies and programmes and reverse loss of environmental resources', which could potentially cover energy aspects as well.

Notwithstanding the essential role of energy in development, the world had to wait another fifteen years before energy could finally secure entry into the global development agenda under the aegis of the UN as part of the 17 Sustainable Development Goals (SDGs) that were adopted in September 2015, namely SDG 7 (see later). According to the UN, "the new SDGs, and the broader sustainability agenda, go much further than the MDGs, addressing the root causes of poverty and the universal need for development that works for all people".[3] The inclusion of energy under SDGs is certainly a step forward, particularly given the unavoidable linkages of SDG 7 with other SDGs (see Appendix 1).

The SDG 7 aims to "ensure access to affordable, reliable, sustainable and modern energy for all".[4] The three key targets under SDG 7 that have been discussed in this paper are:

- 7.1: By 2030 ensure universal access to affordable, reliable, and modern energy services.
- 7.2: By 2030 increase substantially the share of renewable energy in the global energy mix.
- 7.3: By 2030 double the global rate of improvement in energy efficiency.

While the world has just embarked on the journey towards achieving SDG 7, the second edition of Sustainable Energy for All (SE4All) Global Tracking Framework provides an update on how fast the world moved towards sustainable energy goals between 2010 and 2012. It tracks progress towards universal access to modern energy, doubling the rate of energy efficiency improvements and doubling the share of renewable energy consumption in the global energy mix. The report also assesses whether the world is moving fast enough to achieve those goals by 2030 (see Box 1).

Against the backdrop, the paper makes an attempt to assess the state of play in India as regards the targets set out under SDG7. Although, as mentioned, MDGs did not include an explicit reference to energy, it would be worthwhile taking a look at how energy,

in general, and sustainable energy, in particular, has evolved over the years till it got explicitly recognised as a SDG. Section 2 focusses on the state of play in India's Energy Challenge. Section 3 takes up the targets proposed under SDG 7 with a focus on the state of play of the key targets and the issues and challenges therewith. This section also discusses the relevance of South-South cooperation in the context of accessing clean energy and delineates some best practices on off-grid sector and on the nexus between gender and access to clean energy. Section 4 discusses the state of play and challenges in financing the key targets under SDG 7. Section 5 concludes the paper by taking a heuristic view in the light of the information provided and arguments developed in the preceding sections.

India's Energy Challenge

India is a democratic country with varying endowment of resources and biodiversity that spreads across 29 states and seven union territories. With a population of over 1.2 billion India is unequivocally the most populous democracy in the world. Despite being continually dubbed as an 'emerging economy', the country is still characterised by a significant proportion of the population that are poor and deprived of access to modern source of energy for lighting and cooking, usually referred to as energy poor. The growing population coupled with the country's aspiration to reach a double digit growth in order to drive the lion's share of people above the poverty line has also been driving India's quintessential energy consumption. The major share of India's energy consumption is made up of fossil fuels and the country is also a net importer of energy that comprises largely crude oil.[5] Figures 1 to 4 delineate India's performance in terms of some of the key indicators on energy consumption that have been identified in the India Country Report on MDG brought out by the Ministry of Statistics and Programme Implementation in 2015.[6]

As seen from Figure 1, per-capita energy consumption (PEC)[7] increased four-fold from 2232.5mega joules in 1990-91 to 6748.61 mega joules in 2012-13. The energy intensity of GDP[8] (at 1999-2000 prices) (Figure 2) displays a mixed trend. It dropped continuously from 1990-91 to 2006-07; registered an increase in between from 2006-07 to 2007-08, dropped again in 2008-09 and rose thereafter till 2012-13 reaching nearly the level attained in 1990-91, and thereby doing away with much of the energy intensity improvements registered in the post-liberalisation era. This reversal in trend is certainly a

Box 1: Key Findings of the Global Tracking Framework (GTF) 2015

The GTF 2015 reports that 1.1 billion people in the world still live without electricity and almost 3 billion still cook using polluting fuels like kerosene, wood, charcoal and dung. And, while picking up steam, renewable energy generation and energy efficiency improvements will need to accelerate dramatically.

In the two-year period since the last Global Tracking Framework in 2013, the number of people without access to electricity declined from 1.2 billion to 1.1 billion, a rate of progress much faster than the 1990-2010 period. In total, 222 million people gained access to electricity during this period, higher than the population increase of 138 million people. These gains were concentrated in South Asia and Sub-Saharan Africa, and mainly in urban areas. The global electrification rate increased from 83 per cent in 2010 to 85 per cent in 2012.

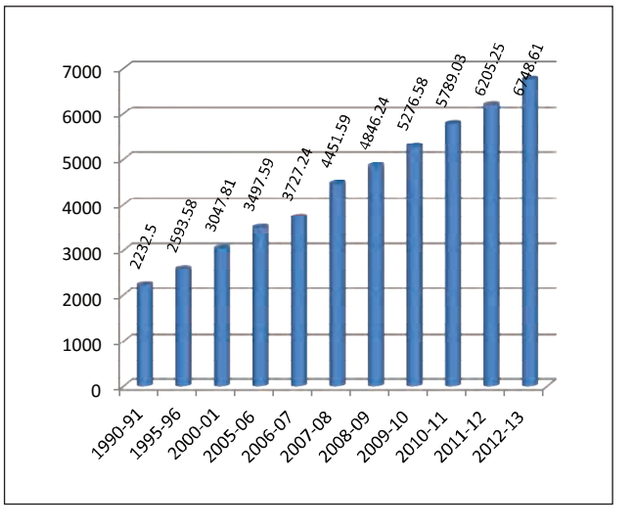
But there was less progress on access to clean cooking fuel with 2.9 billion people still using biomass fuels like wood and dung – most of this population clustered in rural areas of Sub-Saharan Africa, South Asia, and eastern Asia.

On the positive side, the share of modern renewable energy (from sources including hydro, solar and wind energy) grew rapidly at 4 per cent a year during the tracking period. Modern renewables made up 8.8 per cent of total global energy consumption in 2012. Still, to meet the 2030 SE4All objective, the annual growth rate for renewable energy needs to be closer to 7.5 per cent.

The report uses energy intensity – global economic output divided by total energy consumption – as a measure of energy efficiency. During 2010-2012, energy intensity fell more than 1.7 per cent a year, considerably more than the annual rate during 1990-2010, but still slower than the SE4All objective of an annual 2.6 per cent drop in energy intensity between 2010 and 2030.

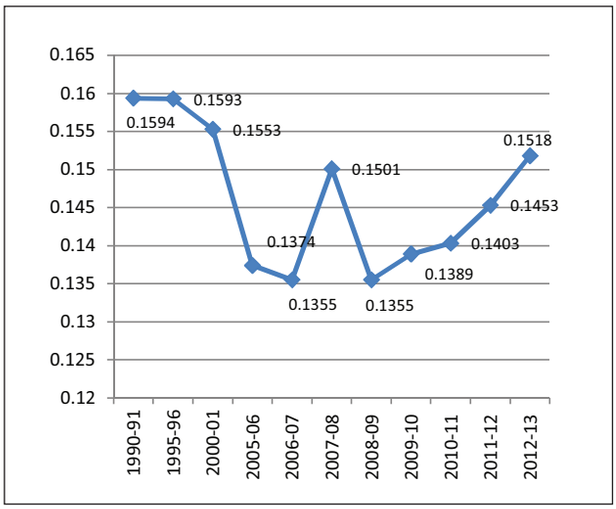
Source: http://www.se4all.org/tracking-progress

Figure 1: Trend in Per Capita Energy Consumption (in mega joules)



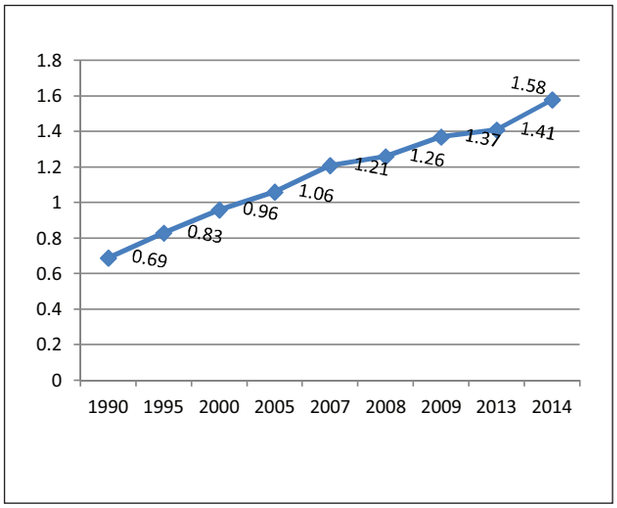
Source: GoI (2011); GoI (2014); GoI (2015)

Figure 2: Trend in Energy Intensity of GDP (mega joules per rupee)



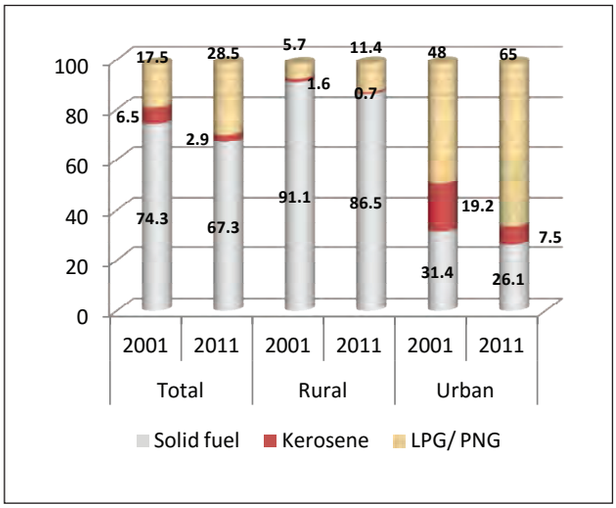
Source: GoI (2015)

Figure 3: Trend in Per capita CO_2 emission (million tonnes)



Source: GoI (2015).

Figure 4: Fuel used for Cooking – Decadal Change (% of population)



Source: GoI (2015).

matter that deserves closer scrutiny, which is beyond the scope of the present paper. As for the per capita CO_2 emissions, it continued to rise progressively and registered more than two-fold increase from 0.69 in 1990 to 1.58 in 2014 (Figure 3), though still it was just one-third of the global average.[9] Regarding composition of the fuel used for cooking, solid fuels,[10] including biomass, still accounted for around 87 per cent of the fuel used for cooking in rural areas compared to 26 per cent in the urban areas (Figure 4), as per the latest census figures. This has serious potential health repercussions, including on women and children due to indoor pollution and compounded time cost in collection of firewood and biomass.

An appropriate way to address the challenge of decoupling India's economic growth from its much needed universalisation of modern energy services to cater to the unmet demand of those who are still deprived of the minimum essential level of access, in line with SDG 7 is through: (a) demand side

management; (b) progressively reducing proportion of carbon intensive fuel in the energy mix and shifting to renewable sources of energy; or (c) a combination of both (a) and (b).The next section takes up these issues in the context of SDG.

Targets Pertaining to SDG 7: State of Play and Key Challenges[11]

The SDG7, as indicated before, has the objective to "ensure access to affordable, reliable, sustainable and modern energy for all".[12]

The three key targets under SDG7 that have been discussed in this paper are:

- 7.1: By 2030 ensure universal access to affordable, reliable, and modern energy services.
- 7.2: By 2030 increase substantially the share of renewable energy in the global energy mix.
- 7.3: By 2030 double the global rate of improvement in energy efficiency.

The next sub-sections capture these three key targets and capture the indicators that are relevant to these three targets.

Indicators on Universal Access to Affordable, Reliable, and Modern Energy Services

Going by the widely accepted definition of access to modern energy services, as brought out by the International Energy Agency (IEA)[13], two key indicators of modern energy access could be:

- Household access to a minimum level of electricity for lighting; and
- Household access to safer and more sustainable cooking and heating fuels and stoves.

The next two sub-sections delve into these key indicators in the context of India largely in light of the data sourced from the decennial Census of India.[14]

Household Access to Electricity for Lighting

Conventional grid extension is the predominant mode of electrification in India, covering around 95 per cent of the inhabited villages. Despite the efforts by the central and state governments to improve electricity services since the 1950s, household electrification level and electricity availability in India continue to remain way below the global average. While the global average electrification rate in 2011 was around 81.9 per cent, the average electrification rate for India stood at 75.3 per cent.[15] In absolute terms, almost 77 million households[16] in India were living without electricity as of 2011 (Figure 5). Considering the overall situation of electrification in the states, in Goa, 96.9 per cent of households have access to electricity, which is the highest among all the states, and Jharkhand had the least percentage of households having access to electricity, only 45.8 per cent in 2011. As for the rural households, 55.3 per cent had access to electricity for lighting (Figure 5). Himachal Pradesh had the highest percentage among all states where 96.6 per cent of rural households had access to electricity. Bihar had the lowest percentage with only 10.4 per cent. The urban India fared much better than the rural India, with 92.7 per cent of households having access to electricity for lighting (Figure 5). Sikkim had the highest percentage with 98.7 per cent of urban households having access to electricity, and Bihar had the lowest percentage with only 66.7 per cent of urban households having access to electricity.

Figure 6 sourced from Census data further shows the percentage distribution of population by various sources of lighting at the national level for 2001 and 2011. In 2001, 55.85 per centof the population had access to electricity for lighting, which increased to 67.25 per cent in 2011. The figure also shows that the dependence on kerosene for lighting reduced to 31.43 per cent in 2011 from 43.3 per cent in 2001.

Importantly, the government definition of what is meant by an electrified village has itself undergone modifications over time. Till 2003, the electrification rate was measured as the percentage of electrified villages with grid extensions to any point within village revenue boundaries. This was irrespective of whether any household within the village was actually connected to the grid or not. In other words, the measure of electrification rate was village-centric, thereby failing to capture the actual percentage of connected households within a village, which is more crucial.

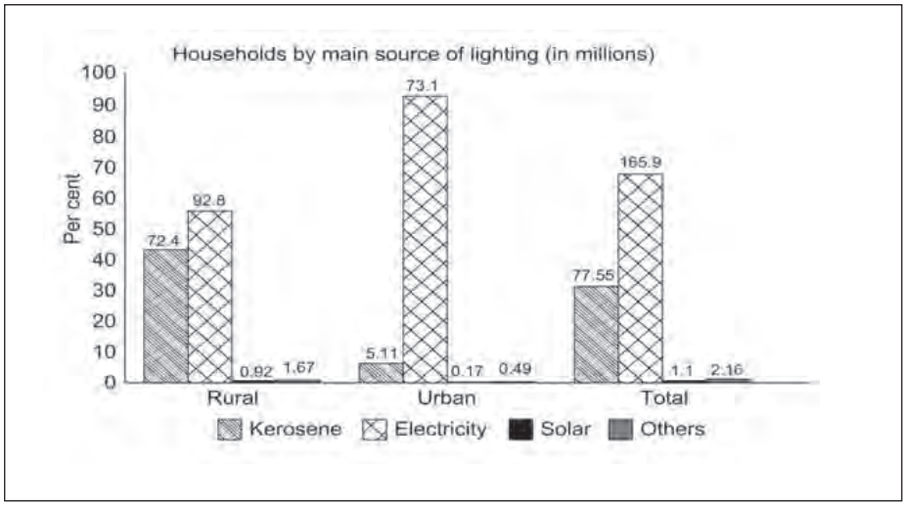
The definition of an electrified village was, however, modified in 2004 by the introduction of criteria such as the requirement of village electricity infrastructure and a minimum of 10 per cent household coverage. However, even in this new definition the focus continued to remain on physical access, thereby failing to attach adequate emphasis on the delivery and reliability as components of electrification. Besides, there are various other barriers confronting

the poor households to actually obtain (and retain) access to electricity even if their village is 'officially' connected to the grid,[17] which are not captured by the new definition either.

The Role of Decentralised Distributed Generation[18]

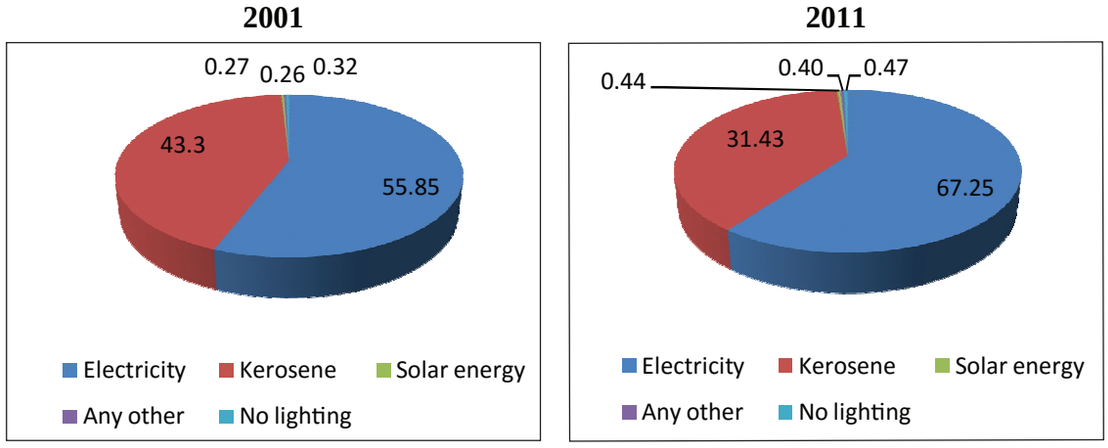
Although the centralised grid has been extended to more than 100 thousand villages under the Rajiv Gandhi GrameenVidyutikaranYojana (RGGVY)[19] by now, unless enabling complementary policies are put in place to improve the last mile distribution management and capacity addition in the sub-distribution network, the electricity supply situation would continue to remain unstable and unreliable. Besides, there are some generic problems that could be identified in remote rural areas where the households have taken electricity connections. First, the state electricity distribution companies do not send the bills for months together leading to piling up of arrears and the poor households find it extremely difficult to pay these arrears and eventually their connections get cut-off. Second, a large number of households refuse to take grid based connection due to poor quality of electricity supplied[20]. With a considerable proportion of un-electrified and under-electrified (without reliable electricity supply) population still looming large, many start-ups and private developers have ventured into the business of providing last mile connectivity through micro-grids in remote rural areas in energy-poor states like Bihar and UP. Most of these micro-grids, however, remain

Figure 5: Electricity Access in India



Source: Census of India 2011

Figure 6: Electricity Access in 2001 and 2011



Source: Census of India 2011

confined to just a few districts of the aforementioned states albeit enormous potential for scaling-up. As for the government supported mini-grid programme, which were initiated in the mid-1990's, it was also confined to only the Sunderbans region in West Bengal and remote tribal habitations of Chhattisgarh.[21]

Recognising the challenges of ensuring the last mile connectivity through grid extension, the Ministry of Power, Government of India, in its tariff policy resolution dated 28 January 2016 has explicitly recognised the importance of ensuring the last mile connectivity by creating an enabling condition for investing in micro-grids based on renewable energy sources and also mandated appropriate regulation to make these micro-grids functional and viable. The tariff policy resolution underscored that in order to mitigate risks and incentivise investment in micro-grids, an appropriate regulatory framework needs to be put in place by the regulatory commission to mandate compulsory purchase of power into the grid from such micro-grids. The time period for such notification as indicated in the tariff policy is six months.

However, there are some grey areas that still exist when it comes to evaluating grid *vis-a-vis* micro-grid from regulatory perspectives. First, there is no parity between the micro-grid and grid-based tariff, which puts the micro-grid at an obvious position of disadvantage. Second, a very crucial operational issue is the interconnection of the micro-grids with the centralised grid system. The key regulatory issue here is development of appropriate standards that will allow for a cost effective interconnection solution without jeopardising the safety and reliability of the electric power systems.

Relevance of South-South Cooperation

In the context of universal electrification, particularly when it comes to challenges in providing electricity to households in the remote villages in the landlocked regions, an important yet not much explored avenue could be to explore South-South cooperation in the form of cross-border trading in electricity between adjacent neighbouring countries. This could potentially provide electricity for lighting to the villages in the border regions of two neighbouring countries which otherwise remain completely isolated from the nationalised grid connectivity because of prohibitive costs associated with grid extension in the border areas.

Power trading in South Asia already exists at a bilateral level between Nepal and India and Bhutan and India. Incidentally, the Bhutan-India power trading is frequently cited as the most successful instance of bilateral energy trading in South Asia. Although longstanding disputes and lack of political will, coupled with mistrust between the countries of the region, have effectively blocked even modest efforts to encourage regional energy trading in the past. The current unanimity on the need for establishing a South Asian market for electricity (SAME), based on a proposal from India in the Thimphu Summit of SAARC in April 2010, did show some light at the end of the tunnel. The initiative is particularly important for exploiting the complementary opportunities for these countries to capitalise on their individual energy resource endowments for mutual benefit. Box 2 provides a snapshot of notable initiatives that have been undertaken at the SAARC level towards realising the benefits of energy trading in the region.[22]

Access to Clean Cooking Fuels or Clean Technology for cooking

Cooking is the major household activity in India requiring energy. Fuel wood, kerosene, and liquefied petroleum gas (LPG) are the three major energy sources for cooking. However, there has only been a gradual shift from fuel wood and kerosene to LPG for cooking.[23] Figure 4 depicted the decadal change in the pattern of energy used for cooking from solid fuels to LPG/PNG, clearly indicating that biomass still continued to be the dominant fuel for cooking for a vast majority of rural population (87 per cent). This is predominantly attributable to the abysmally low penetration of LPG in rural areas, which more than offsets the urban penetration of LPG, thereby bringing down the extent of penetration of LPG at the national level to an unimpressive 28.5 per cent of population (Figure 4). A state-wise analysis, however, shows a wide variation with Punjab having the highest percentage of households (59.5 per cent) using LPG for cooking and Bihar having the least percentage with only 8.1 per cent.[24]

This only compounds the problem of indoor air pollution, and accounts for significant rise in premature mortality and morbidity as reported by WHO. This may also have implications for attaining the Target 3.9 under SDG 3 that aims to "substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water, and soil pollution and contamination" by 2030. Therefore, it is crucial to examine other clean

Box 2: SAARC Level Cooperation on Energy Trading: A Snapshot

The initiatives at the SAARC level on energy cooperation began in a notable way. The SAARC Energy Ministers agreed to cooperate in harnessing all forms of energy in order to achieve the objective of creating an 'Energy Ring' in South Asia. A special purpose vehicle called SAARC Energy Centre was eventually created in order to facilitate the process.

In January 2007, the SAARC Secretariat finalised the terms of reference of SAARC Regional Energy Trade Study (SRETS). The Terms of Reference included, among other things, analysing the prevailing trade regimes, the regulatory and legal frameworks of the Member States; examining the international and regional best practices and their relevance as well as applicability to the region; analysing various technological, financial and commercial options for promoting trade and related projects; examining the viability and modalities for development of trans-national energy lines (electricity, gas and oil) keeping in view the broader concept of the 'Energy Ring'.

This was followed by the 15th SAARC Summit in August 2008 where it was decided by the SAARC countries to develop and conserve conventional sources of energy along with a strong focus on alternate and renewable energy sources, energy reforms, energy efficiency, transfer of technology and energy trading.

In November 2008, in an expert group meeting, the concept paper on SAARC Energy Ring was finalised. The meeting also decided that the member states would develop common regional highways of energy within and across the region for movement of energy commodities and services in a market-based environment. The meeting also discussed the possibilities of harnessing hydro-potential in Bhutan and Nepal; getting natural gas from the West, Central and East Asia; sharing expertise of India in wind and solar energy and of Nepal in micro-hydro; and the successful experience of CNG technology in Bangladesh, India and Pakistan.

In December 2008, a task force was constituted to evolve a Common Template of Technical and Commercial aspects of Electricity Grid Inter-connections among SAARC Member States in order to have better understanding of the power system of each country.

In January 2009, the SAARC Energy Ministers' meeting underscored the regional energy trading study, setting an action plan on energy conservation and efficiency, discussed the concept of the South Asian Energy Ring and the common template on technical and commercial aspects of electricity grid interconnections among SAARC member countries and a concept paper on joint import of crude oil.

All these issues received a renewed emphasis in the 16th SAARC Summit held in April, 2010 at Thimphu, Bhutan. In the Summit the state leaders emphasised the need to undertake studies to develop regional energy projects; promote regional power trading, efficiency, conservation; development of labelling and standardisation of appliances; and sharing of knowledge and technologies.

Although the power trading in South Asia is yet to mature, the leaders recognised the importance of facilitating the same on an urgent basis in order to meet the electricity deficits in the region in a cost-effective manner. In this context, a proposal submitted by India on preparing a roadmap for the SAARC Market for Electricity (SAME) on a regional basis supported by an enabling market in the region was well received. The proposal's main emphasis is on coupling the independent electricity grids of different countries through HVDC (High Voltage Direct Current) links.

The issues related to energy cooperation among the SAARC countries was also discussed in the 17th SAARC Summit that took place in the Maldives, in 2011. It declared the conclusion of the Inter-governmental Framework Agreement for Energy Cooperation and the study on the Regional Power Exchange Concept as also the work related to the SAARC Market for Electricity. In addition to this, it was apprehended that the SAARC member countries should invest an appropriate proportion of their national incomes to the renewable energy sector.

The 5th SAARC Energy Ministers' Meeting, held in October 2014, finalised the SAARC Framework Agreement for Energy Cooperation (Electricity). This is a significant achievement of the Ministers' meeting, as this Agreement had been pending since 2010 and is a crucial step towards developing a SAARC Market for Electricity (SAME) on regional basis.

Source: RIS (2015).

cooking energy solutions as compared to LPG that can bring down the indoor air pollution burden and drudgery associated with the use of traditional cooking fuels, without compromising on affordability and sustainability in the long run. Some options are: PNG, electricity, as well as the decentralised options such as biogas and improved biomass based cook stoves, although each of these options has its own share of benefits and problems. Table 1 summarises a multi-criteria based comparative assessment across different non-LPG options available in India.

The government has also been pursuing a number of programmes for promoting clean fuels for cooking, such as extending city gas distribution networks for PNG, the National Biogas and Manure Management Programme (NBMMP) for biogas plants, the *Unnat Chulha Abhiyan* for improved cook stoves, and Rajiv Gandhi Village LPG Distribution Scheme (known as RGGLVY), besides distribution of subsidy on LPG through direct cash transfer (known as DBTL). The last one is aimed at improving LPG penetration in the country, preventing malpractices and ensuring that the subsidy reaches the intended beneficiaries. Though these programmes have been operating for a number of years, the results do not appear to be heartening, with a vast majority of Indian households still relying on traditional solid fuels for cooking, as discussed above. Furthermore, these programmes and schemes clearly lack synergy and are being implemented in silos. It is imperative, therefore, to integrate these efforts in consonance with the Sub-goal 7.1 of SDG. The integration, if undertaken effectively, could also ensure adequate and more efficient allocation of resources towards ensuring access to sustainable and modern energy services for cooking. Therefore, the need of the hour is to synergise these programmes and execute them in a mission mode and in a continued manner in order to bring about any perceptible impact on public health due to indoor air pollution, besides reducing the drudgery associated with the collection and use of traditional solid biomass, especially for women and children in rural India.[25]

Besides integration of multiple programmes with a unified objective, such a mission should also generate awareness among the masses about the negative consequences of utilising traditional fuels for cooking. Awareness generation would facilitate generating demand for clean cooking energy solutions from below. The awareness generation should particularly focus on women who, along with their children, turn out to be the worst victims of indoor air pollution. In that context the initiatives undertaken by Self Employed Women's Association (SEWA) and Barefoot College for generating awareness among the women, deserve special mention and insights could be drawn from these initiatives (see Box 3).

Indicators on the Share of Renewable Energy in the Total Energy Mix

The Ministry of New and Renewable Energy (MNRE) is the nodal ministry of the Government of India that deals with renewable energy. As per the ministry, renewable energy technologies mainly include grid-

Table 1: A Comparative Assessment of Various non-LPG Cooking Fuel Options in India

	Affordability - LCOE	Health impacts	Assurance of fuel supply	Convenience of cooking	Resilience of the technology	Environmental impacts/ GHG emissions
Biogas						
Improved cook stoves						
Electric stove						
Induction stove						
LPG						
PNG						
Legend:		**Best in class**	**Good**	**Neutral**	**Bad**	**Worst in class**

Source: Jain et al., 2015

interactive power and off-grid/captive power. Grid-interactive power includes power from wind, small hydro,[26] biomass gasification, bagasse cogeneration, solar, and waste-to-energy. Off-grid/captive power comprises biomass (non-bagasse) cogeneration, Solar Photovoltaic (SPV) systems, aero-generators/hybrid systems, water mills, biogas-based energy systems, waste-to-energy, and biomass gasification in rural and industrial areas for captive use. Other renewable energy technologies include family biogas plants and solar water heating solutions. The percentage of renewables in the total installed capacity for power generation in India was 12.3 per cent in 2012-13. The target for deployment of grid-based renewable power was 4125 MW, and the achievement was 1352.68 MW in 2012-13 (MNRE, 2014).

Figure 7 shows the shares of various sources of energy in the installed capacity of power in India in 2000 and 2012. As can be inferred from the figure, the share of renewables has increased from 1.46 per cent in 2000 to 19.95 per cent in 2012. The share of thermal energy (coal, gas, and diesel) has declined from 75.06 per cent in 2000 to 65.02 per cent in 2012. Figure 8 delineates the shares of various sources of grid-based renewable energy in India in the total installed capacity of renewable energy from 2007-08 to 2011-12. Wind energy contributes 70 per cent in the total installed capacity of grid-based renewable energy, and its share is almost constant in the five-year period.

Figure 8 shows the targets and achievements of grid-based renewable energy in India for 2013-14. As can be inferred from the graph, only 808 MW of wind power was installed against a target of 2500 MW for 2013-14. Solar energy had achieved 35 per cent of the target, and 395 MW of solar energy was deployed against the target of 1100 MW.

The National Solar Mission aims at increasing the share of solar-based installed capacity of power generation to 100 000 MW by 2022.[27] As on 31 December 2014, the capacity for solar power stood at 3062.68 MW, and Gujarat had the highest installed capacity of 824 MW in India.[28] Hence achievement of the 2022 target seems to be a tall order!

Figure 9 provides the source-wise targets and achievements of off-grid renewable energy in India. By adding all the sources of off-grid renewable power, the total target comes out to be 145 MW, against which only 38.78 MW was deployed, that is, only 26.74 per cent of the target could be achieved at all-India level in 2013-14. Biomass gasifier installed for industrial use achieved 52.67 per cent of the target.

It deserves to be mentioned here that the renewable energy technologies for decentralised distributed generation (DDG) such as solar photovoltaic (PV) devices, biomass gasifier and mini/micro hydro power plants have particularly been disseminated in areas which are either inaccessible for grid connectivity or in hamlets that are not recognised as a village[29]as per the national census record.[30] These communities with access to these devices or technologies, as mentioned above, are often characterised by scattered settlements,

Box 3: Mainstreaming Gender in Clean Energy Provision: Initiatives by SEWA and Barefoot College

The Self Employed Women's Association (SEWA), a trade union that serves the needs of poor and self-employed women and their families in India, has been building awareness about the benefits of clean fuels and cook stoves. SEWA buys the stoves in bulk and provides loans to enable their members access these with small monthly payments.

"Wood collection used to take me four hours a day with additional time needed when people came to visit," says Sharadaben, a Gujarati member of SEWA. She further adds, "With an efficient stove, it is easier to welcome guests. I also used to have problems with my eyes because of the smoke blowing from the *chulha* (traditional cooking stove). The new stoves will ease the discomforts faced by many cooks."

The Barefoot College, an Indian NGO, provides training to women to become leaders in creating alternative energy solutions for their rural villages. The college provides six months' training in installing, repairing and maintaining solar lighting units for women to become 'Barefoot Solar Engineers' (BSEs). As a result women have built around 10,000 household solar lighting systems globally since 1986, and report an increase in social status in their villages.

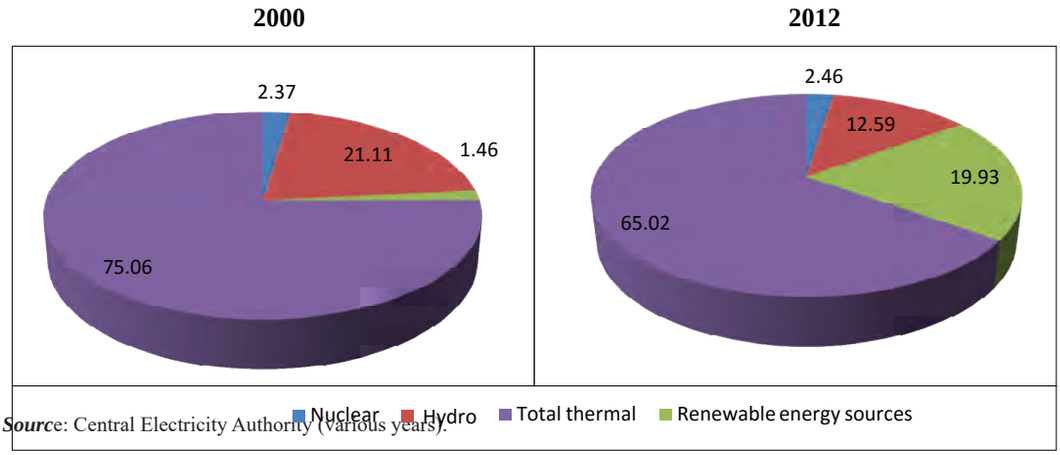
Sources: http://www.mrfcj.org/pdf/Enabling_womens_development_and_empowerment_thru_access_to_clean_affordable_sustainable_energy.pdf and http://www.barefootcollege.org/(accessed on 03 September 2015)

consist primarily of small, low-income households. Hence, they are essentially economically unattractive communities for electricity distribution companies (DISCOMS) for grid extension, owing to the inability of consumers to pay the set tariff on a regular basis. Moreover, the life line tariff is usually lower than the cost to supply to these remote areas.

The state renewable energy development agencies, established by the state governments and working under the aegis of the MNRE, have tried to address this vacuum. For instance, the Remote Village Electrification Programme (RVEP) and Village Energy Security Programme (VESP) have made provision of electricity, either through mini-grids or solar home systems[31] . In addition, NGOs have implemented numerous pilot projects by raising funds from donor agencies and receiving funds from corporate social responsibility (CSR) initiatives.[32] Box 4 presents a widely cited best practice case in providing last mile access to modern energy services in the form of electricity through off-grid mode - known as the Lighting a Billion Lives (LaBL), an initiative pioneered by The Energy and Resources Institute (TERI)

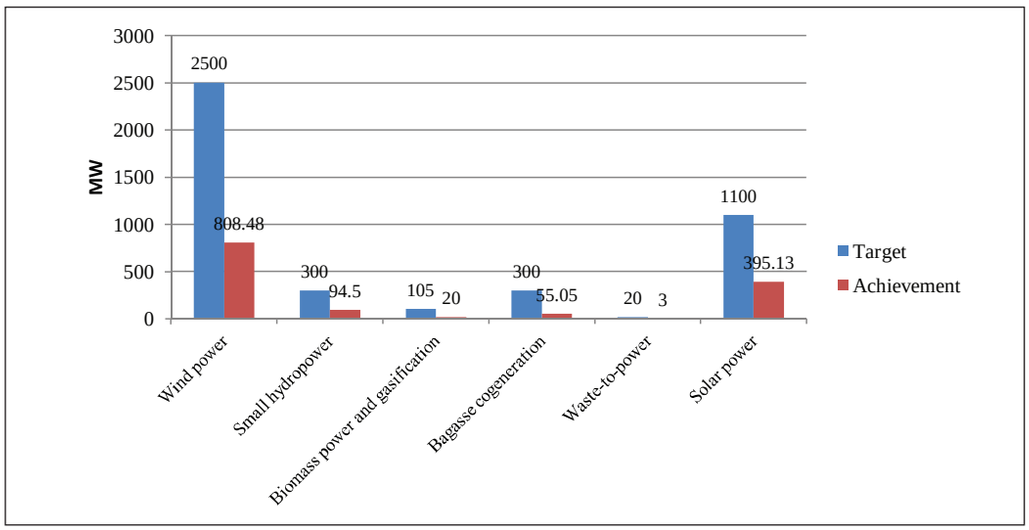
Recent trends indicate that Decentralised Distributed Generation (DDG) technologies based on renewable energy sources are progressively emerging

Figure 7: Share of Different Sources of Energy in Installed Capacity of Power in India in 2000 and 2012



Source: Central Electricity Authority (various years).

Figure 8: Target Versus Achievement of Grid-based Renewable Energy in India (2013-14)



Source: MNRE (2014).

Box 4: Lighting a Billion Lives (LaBL)

Lighting a Billion Lives (LaBL) is a global initiative started by TERI to facilitate clean energy access and the delivery of last mile energy services for basic and productive use. The initiative enables energy poor communities to transition from traditional and inefficient energy sources to modern, more efficient and sustainable energy solutions. Operating through an entrepreneurial model of energy service delivery, LaBL accelerates market development for clean energy technologies through knowledge sharing, capacity building and market seeding. The programme offers diverse technology options based on affordability and end user requirements such as, solar lanterns, solar charging stations, micro grids, improved cook stoves, independent home lighting systems and integrated domestic energy systems that address both lighting and cooking energy needs in a single unified system. The interventions focussed their efforts towards the achievement of three main objectives:

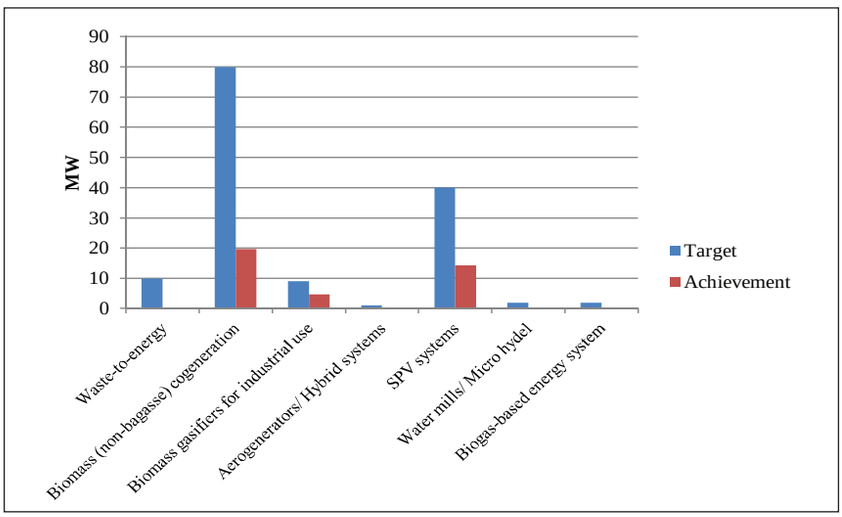
- To replace inefficient and harmful lighting and cooking methods with efficient, affordable and reliable clean energy alternatives.
- To enable the productive use of clean energy for enhanced education, better health and improved livelihood opportunities – thereby empowering the poor to escape the poverty trap
- To facilitate access and adoption of demand-responsive solutions at the last mile through capacity building and enterprise development.

Source: http://labl.teriin.org/about.php

as a potential business opportunity – be it in the form of purely private ventures or public private partnership (PPP). For instance, studies estimating the annual market potential of only off-grid energy services in India indicate that it could be as high as US$2 billion.[33] Given the role that decentralised distributed generation play in providing last mile connectivity (as discussed earlier), coupled with huge business prospects, the issue of developing regulatory arrangements for expansion and governing this sector deserves particular attention. Regulation assumes significance both from the point of view of commercial viability of providing electricity services through DDG based on renewable energy and to ensure that the grid and DDG are at a level playing field when it comes to providing the last mile connectivity. This will also ensure that the consumers get access to reliable services at an affordable price.[34]

As for the SDG Target 7.2 of substantially increasing the share of renewable energy in the global energy mix, it may be noted that the Intended Nationally Determined Contribution (INDC)[35] submitted to the UNFCCC prior to the Paris Climate

Figure 9: Source-wise Target and Achievement of off-grid Renewable Energy in India (2013-14)



Source: MNRE (2014).

Conference (December 2015), mentions that "India's share of non-fossil fuel in the total installed capacity is projected to change from 30 per cent in 2015 to about 40 per cent by 2030". It further mentions: "To accelerate development and deployment of renewable energy in the country, the Government is taking a number of initiatives like up-scaling of targets for renewable energy capacity addition from 30GW by 2016-17 to 175 GW by 2021-22.The renewable power target of 175 GW by 2022 will result in abatement of 326.22 million tonnes of CO_2 equivalents per year. The ambitious solar expansion programme seeks to enhance the capacity to 100 GW by 2022, which is expected to be scaled up further thereafter. This will include scaling up efforts to increase the share of non-fossil fuel based energy resources in total electricity mix including wind power, solar, hydropower, biomass, waste-to-energy and nuclear power."

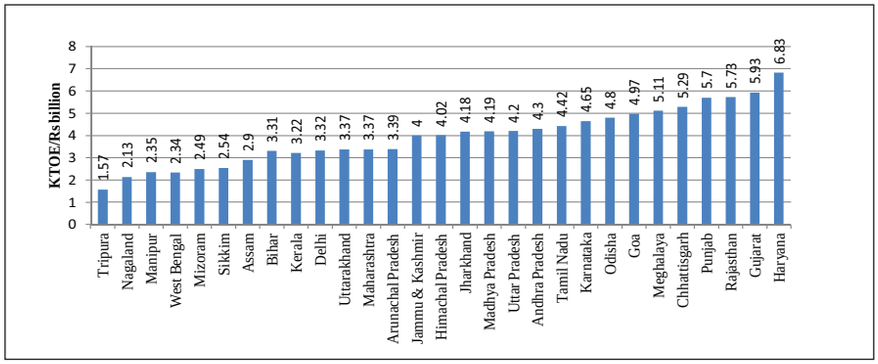
While achievement of the aforesaid targets, particularly on solar, is quite an ambitious proposition, the inclusion of these targets under the INDC may go a long way in making the country accountable to the global community, going by the way the post-2020 climate regime is expected to emerge after Paris. As for SDG 7, this is certainly a step taken by India in the right direction, though challenges galore as discussed above.

Indicators on the Rate of Improvement in Energy Efficiency

Considering the vast potential of energy savings and benefits of energy efficiency, the Indian Government enacted the Energy Conservation (EC) Act, 2001. The Act provides for the legal framework, institutional arrangement, and a regulatory mechanism at the central and state levels to embark upon energy efficiency drive in the country. Five major provisions of the EC Act relate to designated consumers, standard and labelling of appliances, energy conservation building codes, creation of institutional set-up, and establishment of an energy conservation fund. The Bureau of Energy Efficiency (BEE) was set up as the statutory body on 1st March 2002 at the central level to facilitate the implementation of the EC Act. Some of the schemes, that have been initiated by the BEE in line with the EC Act to promote energy conservation and energy efficiency, include: (a) Standards and labelling of equipment and appliances; (b) Energy Conservation Building Codes for commercial buildings; (c)Demand Side Management Schemes; (d) Capacity Building of DISCOMS (electricity distribution companies of India) for carrying out load management programme, energy conservation programme, development of Demand Side Management (DSM) action plan and implementation of DSM activities in their respective areas; (e) School Education Programme on energy efficiency; (f) Human Resource Development; and (g) National Mission for Enhanced Energy Efficiency (NMEEE).

The NMEEE, one of the eight national missions under the National Action Plan on Climate Change (NAPCC) released by India in 2008, aims to strengthen the market for energy efficiency by creating conducive regulatory and policy regimes besides fostering innovative and sustainable business models for the energy efficiency sector. The NMEEE has under its ambit four key initiatives to enhance energy efficiency

Figure 10: State-wise Energy Intensity (KTOE/Rs. billion) for 2011-12



Source: TERI (2015).

in the energy intensive industries, which are as follows:

- **Perform Achieve and Trade Scheme (PAT)**, a market based mechanism to enhance the cost effectiveness of improving energy efficiency in the energy intensive sectors through certification of energy savings which can be traded in the market.
- **Market Transformation for Energy Efficiency (MTEE),** for accelerating the shift to energy efficient appliances in designated sectors through innovative measures to make the products more affordable.
- **Energy Efficiency Financing Platform (EEFP),** for creation of mechanisms that would help finance demand side management programmes in all sectors by capturing future energy savings.
- **Framework for Energy Efficient Economic Development (FEEED),** for development of fiscal instruments to promote energy efficiency.

Figure 10 shows energy intensities of all the 29 states in India for the year 2011-12.[36]

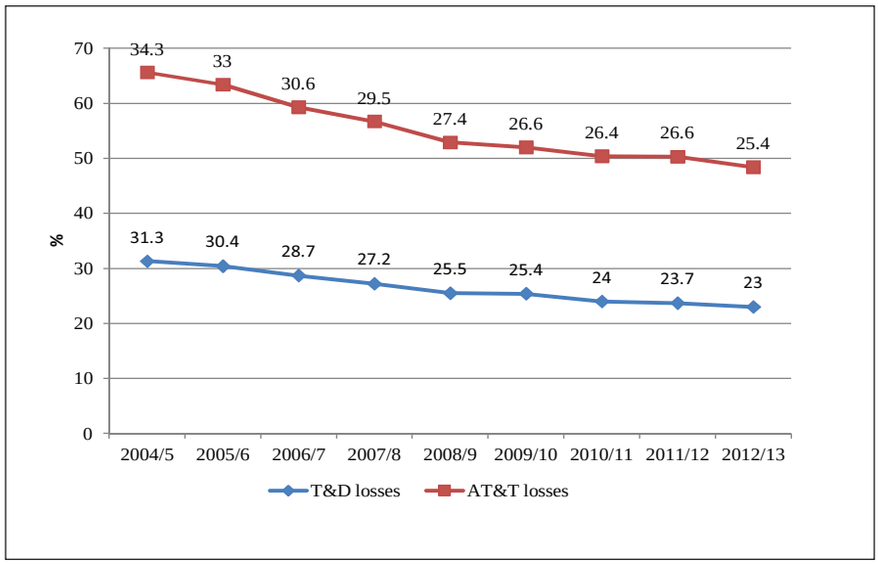
In the context of energy efficiency, a critical challenge that plagues the nation today is the inefficient functioning of the power sector due to colossal energy losses that occur in the process of supplying electricity to consumers due to technical and commercial issues.

The two main sources of leakage in the power system are as follows:

- Aggregate technical and commercial (AT&C) losses; and
- Transmission and distribution (T&D) losses.

The AT&C losses have two components: technical and commercial. The technical losses occur due to the dissipation of energy in the conductors and equipment used for transmission, transformation, sub-transmission, and distribution of power. The commercial losses are caused by pilferage, defective meters, and errors in meter reading and in estimating unmetered supply of energy. The T&D losses also occur due to pilferage. Figure 11 shows the trend in AT&C and T&D losses in India between 2004-05 and 2012-13. Although AT&C losses, which measure a utility's operational and financial performance, fell from 34.3 per cent to 25.4 per cent between 2004-05 and 2012-13, they still remained on the higher side. The T&D losses also fell from 31.3 per cent to 23 per cent, again remaining on the higher side. Notably, the tariff increase has failed to keep pace with the cost increases, thereby contributing to under recovery by the power distribution companies (DISCOMS). A critical reason for deterioration of finances of state utilities is the expense of providing below-cost power to key consumer groups, such as agricultural and rural

Figure 11: India's Grid Transmission, Distribution and Technical Losses 2005-2013



Source: Central Electricity Authority.

consumers (a political decision in many states) and also a substantial portion of domestic consumption, which has weakened the finances of state utilities.

Challenges in Financing the Targets under SDG 7

The Government of India and non-governmental organisations have historically been the largest funders of clean energy in India, and they still are active in their support. The Indian Renewable Energy Development Agency (IREDA), established in 1987 as a Public Limited Government Company, provides financial support and innovative financing for renewable energy and energy efficiency projects with funds from the Indian government and multilateral lending agencies.

Financing Energy Efficiency

The National Mission on Enhanced Energy Efficiency (NMEEE) has two frameworks that cater to financing and fiscal issues:[37]

- **Energy Efficiency Financing Platform (EEFP)**, for creation of mechanisms that would help finance demand side management programmes in all sectors by capturing future energy savings. Under this programme, MoUs have been signed with financial institutions to work together for the development of energy efficiency market and for the identification of issues related to the development of this market.
- **Framework for Energy Efficient Economic Development (FEEED)**, for development of fiscal instruments to promote energy efficiency. Under this initiative two funds have been created, namely Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE) and Venture Capital Fund for Energy Efficiency (VCFEE). Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE) is a risk sharing mechanism to provide commercial banks with a partial coverage of risk involved in extending loans for energy efficiency projects. The Venture Capital Fund for Energy Efficiency (VCFEE) is a fund to provide 'last mile' equity capital for energy efficiency projects. A single investment by the fund shall not exceed INR 2 crores.[38]

Although the legal and institutional landscape on energy efficiency is well established in India and the financing mechanism has already been laid down, as indicated above, there are still some grey areas. Some of these include severe financial strain on DISCOMS due to misalignment of energy subsidies targets; non-availability of low interest loans and lack of investment from the local financial institutions especially the commercial banks. In the context of energy efficiency in the industrial sector under the PAT Scheme, it has emerged from the recent stakeholder consultation[39] that non-availability of low interest loans is a critical constraint. Furthermore, financing institution like Small Industries Development Bank of India (SIDBI) has expressed concern that the Energy Service Companies (ESCOs) business[40] has not taken off in India mainly due to longer litigation processes pertaining to their performance contracts that entails their provision of services, which makes it challenging and for the ESCOs to do business. Besides the aforementioned factors that hinder the progress of energy efficiency, it also deserves to be mentioned that energy efficiency is not included as priority lending under RBI and no favourable tax treatment is given to ESCOs who are functioning in the energy efficiency space.

To deal with the financial distress of DISCOMs, a new scheme – Ujwal DISCOM Assurance Yojana (UDAY) has been introduced in November 2015. The scheme is not just confined to a simple loan or debt restructuring of state power utilities, but aims at turnaround of the distressed entities by putting the greater onus on state governments.[41] UDAY focusses on four major initiatives: (a) improving operational efficiencies of DISCOMs; (b) reduction of cost of power; (c) reduction in the interest cost of DISCOMs; and (d) enforcing financial discipline on DISCOMs through alignment with state finances.[42] UDAY agreements have been signed between the centre and 10 states and their power utilities. Although UDAY is a laudable and much needed initiative in the right direction, the nation's apex bank RBI has expressed concern that state finances might come under stress in the coming years on account of burgeoning liabilities due to takeover of 75 per cent of the existing debt of DISCOMs.

Financing Renewable Energy

The present government has set up an ambitious target to increase India's renewable energy capacities by over five times by 2022. This implies pulling up the capacity from the current 30 Giga Watt (GW) (solar and wind combined) to a target of 175 GW.

The amount of money and hence capital that may be necessary to achieve this has been estimated as close to US$ 200 billion over the duration of the target, which is indeed an onerous task.[43] In order to understand the key challenges involved in mobilising resources in the renewable energy sector, it would be essential to take a stock of the current situation in terms of financing avenues that are available, as discussed below.

The support for renewable energy projects in India usually comes through a combination of federal and state policies. The Ministry of New and Renewable Energy (MNRE) is the nodal ministry that provides policy support on behalf of the federal or central government. Some of the policies include: (a) a generation based incentive of INR 0.5/kWh for grid-connected wind projects; (b) viability gap funding up to 30 per cent of project cost; and (c) accelerated depreciation of 80 per cent for solar projects under the National Solar Mission. The federal policies typically cover only some of the viability gaps, i.e. the difference between the cost of unsubsidised renewable energy and the Average Power Purchase Cost (APPC). The rest is eventually supported by the state governments entering Power Purchase Agreements (PPA) with renewable energy developers, agreeing to pay feed-in tariffs for 20-25 years.[44]

Another important source of financing renewable energy projects is through a corpus called National Clean Energy Fund (NCEF) that was created through a coal cess, often referred to as the clean energy cess now. India imposed a coal cess in 2010 at INR 50 (US$ 0.8) per tonne of coal produced in India or imported into India. Recently it has been quadrupled to INR 200 (US$ 3.2) per tonne of coal in 2015-16 and further to INR 400 in the Union Budget 2016-17. This forms the corpus for the National Clean Environment Fund, used for financing clean energy, technologies, and projects related to it.[45]Although, NCEF is an innovative attempt by the government to raise additional resources for financing clean energy projects, there are several shortcomings with the fund. According to some commentators, the money hardly goes into "new" or "innovative" projects relating to clean energy technologies and is mostly being used to overcome budgetary shortfalls in the MoEF or the MNRE.[46] Despite the NCEF having collected a substantial sum of money, the process of disbursing the funds continues to be mired in confusion.[47] However, according to official claims incorporated in GoI (2015), the total collection of INR 170.84 billion (US$ 2.7 billion) till 2014-15 out of the coal cess is being used for 46 clean energy projects worth INR 165.11 billion (US$ 2.6 billion).

The government also supports the renewable energy sector through generation-based incentives (GBIs), direct subsidies, tax exemptions, cheap credits or reduced import duties.

Further, the Electricity Act 2003 had set out three fiscal incentives to encourage renewables:[48]

- **Renewable Energy Tariffs,** a preferential tariff for energy sourced from renewables.
- **Renewable Purchase Obligations** enforcing the electricity regulators to source a percentage of their electricity consumption from renewables.
- **Renewable Energy Certificates**, a mechanism to procure renewable energy (RE) by different states in similar proportions.

Apart from these incentives, some states like Karnataka and Punjab have their own green energy funds that finance renewable energy projects and research and development.[49,50]

Besides renewable energy is funded through debt instruments[51] and also promoted through Foreign Direct Investment (FDI) which permits 100 per cent investment in RE and tax holidays and financing through the Indian Renewable Energy Development Agency (IREDA). IREDA and Power Finance Corporation (PFC), two government-backed NBFCs, spearhead debt financing of RE projects in India. The other kind of debt instrument includes foreign currency loans that are provided to renewable energy projects by development banks, export-import (EXIM) banks and international banks.[52] A number of private equity (PE) investors are also active in the Indian RE market, where equity usually comprises 30 per cent to 40 per cent of the total project cost, with the rest of the project financed through debt.[53] Importantly, Indian renewable energy companies attracted US$ 548 million in Venture capital (VC) and private equity (PE) funding in 2015, more than all of Europe (US$ 301 million) and second only to the US. This was up sharply on the previous year.[54]

Both international players and domestic companies have progressively scaled up their presence in the Indian renewable energy space. However, the biggest regulatory benefit that accrued recently in the sector is that it has now been brought under the ambit

of sectors that are in the list of priority lending sectors notified by the Reserve Bank of India (RBI). This makes it easier for the commercial banks to participate in the renewable energy space.

Concluding Remarks

The present government has set up an ambitious target to increase India's renewable energy capacities by over five times by 2022. This implies pulling up the capacity from the current 30 GW (solar and wind combined) to a target of 175 GW. The amount of money and hence capital that may be necessary to achieve this has been estimated as close to US$ 200 billion over the duration of the target, which is indeed an onerous task. Exploring the share of renewables in the energy mix, it is indeed heartening to note that the share of renewables has increased from 1.46 per cent in 2000 to 19.95 per cent in 2012. The National Solar Mission aims at increasing the share of solar-based installed capacity of power generation to 100 000 MW by 2022. As on 31 December 2014, the capacity for solar power stood at 3062.68 MW, and Gujarat had the highest installed capacity of 824 MW in India. Although the achievement of the 2022 target seems to be a tall order, considerable progress has been made in augmenting the share of renewable energy in the energy mix.

In the context of energy efficiency, a critical challenge that plagues the nation is the inefficient functioning of the power sector due to colossal energy losses that occur in the process of supplying electricity to consumers due to technical and commercial issues. Furthermore, the tariff increase has failed to keep pace with the cost increases for providing electricity, thereby contributing to under recovery by the power distribution companies (DISCOMS). A critical reason for deterioration of finances of the state utilities is the expense of providing below-cost power to key consumer groups, such as agricultural and rural consumers (a political decision in many states) and also a substantial portion of domestic consumption, which has weakened the finances of state utilities. However, to deal with the problem of ailing DISCOMS, a new scheme called UDAY has been introduced in November 2015. The scheme is not just confined to a simple loan or debt restructuring of state power utilities, but aims at turnaround of the distressed entities by putting the greater onus on state governments. However, the nation's apex bank RBI cautions that this could potentially reduce the fiscal space of the states, which might lead to curtailment of capital expenditure with an adverse impact on growth. It, however, remains to be seen as to how the scheme takes off and whether the concerns raised by RBI actually get vindicated.

To sum up, while India has taken steps forward in the right direction towards achieving the targets set under the umbrella of SDG 7 challenges galore. Hence, it is imperative on the part of the governments, both at the Centre and the states, to identify the gaps, acknowledge them and undertake appropriate and timely measures to close them sooner than later, so that the country makes the much-needed headway towards providing universal access to affordable, reliable, sustainable and modern energy, not only in letter but also in spirit!

Endnotes

1 Keynote speech by Amb. M. Gyan Chandra Acharya, Under-Secretary-General, High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States at the Ministerial Meeting on New partnerships for Productive Capacity Building in the Least Developed Countries on 28 July 2014. Available at: http://www.se4all.org/sites/default/files/l/2014/08/Acharya_Benin-Ministerial.pdf

2 *ibid.*

3 Sustainable Development Goals (SDGs), UNDP. Available at: http://www.undp.org/content/undp/en/home/sdgoverview/post-2015-development-agenda.html

4 "History of Energy in the Sustainable Development Agenda." Sustainable Energy for All. Available at: http://www.se4all.org/sdg7_history

5 GoI, 2014.

6 GoI, 2015.

7 This is calculated as the ratio of the estimate of total energy consumption during the year to the estimated mid-year population of that year.

8 This is calculated as the amount of energy consumed for generating one unit of Gross Domestic Product

9 "6 Graphs Explain the World's Top 10 Emitters" at http://www.wri.org/blog/2014/11/6-graphs-explain-world%E2%80%99s-top-10-emitters

10 Solid fuels comprise fire wood, crop residue, cow dung cake and cola, lignite and charcoal

11 This section draws heavily on TERI Energy and Environment Data Diary and Yearbook (TEDDY) 2014-15, Chapter 14 on Sustainable Energy.

12 *ibid 4.*

13 See for more details "Energy Poverty: How to make modern energy access universal?" Special early excerpt of the World Energy Outlook 2010 for the UN General Assembly on the Millenium Development Goals at http://www.se4all.org/sites/default/files/l/2013/09/Special_Excerpt_of_WEO_2010.pdf

[14] Details available at http://censusindia.gov.in/Data_Products/Library/Indian_perceptive_link/Census_Operation_link/censusoperation.htm

[15] IEA (2013).

[16] Census of India (2011a).

[17] For further details, refer Palit and Bandyopadhyay (2015).

[18] This section draws heavily on discussions carried out with Mr. Debajit Palit, Associate Director, TERI. Two papers that have been largely consulted are Palit and Chaurey (2011) and Palit and Bandyopadhyay (2015).

[19] Rajiv Gandhi GrameenVidyutikaranYojana (RGGVY) being implemented in Indian states mostly to provide benefits to households below the "poverty line" (BPL) through a free connection but chargeable consumption of power. The principal aims of RGGVY being implemented since 2005 are the following: (1) Electrifying all villages and habitations as per new definition, (2) Providing access to electricity to all rural households, (3) Providing electricity connection to Below Poverty Line (BPL) families free of charge.

[20] Palit and Bandyopadhyay (2015).

[21] Palit and Chaurey (2011).

[22] RIS (2015).

[23] Census of India (2011b).

[24] TERI (2015).

[25] Jain *et al.*, (2015).

[26] The government is mulling to bring big hydropower plants under the ambit of renewable energy, giving the capital-intensive projects access to international funds and benefits available to green power (source: http://articles.economictimes.indiatimes.com/2016-01-18/news/69870120_1_hydropower-projects-power-generation-power-producers).

[27] Details available at: http://pib.nic.in/newsite/PrintRelease.aspx?relid=114436.

[28] MNRE (2014).

[29] The Census of India considers those areas as rural and where the population is below 5000 and the density of population is less than 400 per square km. It further provides that in such areas at least 75 per cent of the males of the working population are engaged in agricultural pursuits. A village is an aggregate of houses in rural setting as defined above. A hamlet is smaller than a village.

[30] Palit and Chaurey (2011).

[31] Majority of these villages and hamlets, taken up for electrification under Remote Village Electrification Programme of MNRE were provided with solar home systems (Palit 2013)

[32] Palit and Bandyopadhyay (2015).

[33] Bairiganjan *et al.* (2010).

[34] Palit and Bandyopadhyay (2015).

[35] http://pib.nic.in/newsite/PrintRelease.aspx?relid=128403

[36] Energy intensity (measured in KTOE/ Rs. billion) has been estimated by summing up the consumption of fuels such as, coal, petroleum products, natural gas, and electricity (only nuclear and renewables) and dividing by the gross state domestic product (GSDP) at constant (2004/05) prices. The data have been compiled from agencies such as Planning Commission, Coal Directory of India, Indian Petroleum and Natural Gas Statistics, and All India Electricity Statistics. In the absence of a single measure that represents the energy intensity of the states, energy consumption has been estimated by summing fuel-wise final energy consumption across all the sectors and dividing the result by GSDP at constant (2004/05) prices.

[37] National Mission for Enhanced Energy Efficiency (NMEEE) at https://beeindia.gov.in/content/nmeee-1 (accessed on 7 April 2016).

[38] *ibid.*

[39] PAT Pulse, January 2016. Available at http://shaktifoundation.in/report/pat-pulse-january-2016

[40] An energy savings performance contract (ESPC) is a. model where an Energy Services Company (ESCO) achieves energy savings at a property or portfolio of properties as a service. This model guarantees savings for a set period of time in exchange for payment from the energy cost savings. (available at http://betterbuildingssolutioncenter.energy.gov/sites/default/files/attachments/ESCO%20Financing%20Summary.pdf)

[41] "Uday gives discoms a chance to name and shame defaulters." *LiveMint.* Available at: http://www.livemint.com/Industry/zud2aAOB27L7Yu56m0Zp2J/Uday-gives-discoms-a-chance-to-name-and-shame-defaulters.html (accessed on 8 April 2016)

[42] "UDAY is a game changer: Piyush Goyal." *LiveMint*. Available at: http://www.livemint.com/Politics/7pKwAJCjhMZjqqLZxidSDN/UDAY-is-a-game-changer-Piyush-Goyal.html (accessed on 8 April 2016)

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[44] Shrimali *et al.* (2014).

[45] "Proactive Steps in Budget 2010-11 for the Environment." Available at: http://pib.nic.in/newsite/erelease.aspx?relid=58419

[46] Jha (2014).

[47] Panda and Jena (2012).

[48] "India: Implementing incentives focused on energy." *IDDRI Working Paper*, p.10. Available at: http://sa.indiaenvironmentportal.org.in/files/file/INDIA%20-%20energy.pdf

[49] *ibid,* p. 13.

[50] http://mnre.gov.in/information/renewable-energy-regulatory-framework

[51] USAID (2013).

[52] *ibid.*

[53] Jha (2014).

[54] Frankfurt School-UNEP Centre/BNEF (2016).

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Census of India. 2011a. Census Info India 2011: Houses, Household Amenities and Assets (Version 2.0). Details available at: http://www.devinfolive.info/censusinfodashboard/website/index.php/pages/source_lighting/Total/electricity/IND

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Appendix 1: Connectivity of SDG7 with other SDGs

SDG No.	SDG Description	Linkage	SDG Target N0.
1	End poverty in all its forms everywhere	Access to basic energy services is a requirement for poverty eradication	1.4, 1.5
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	Agriculture and energy at times compete for land – for instance in biomass feedstock production	2.3, 2.4
3	Ensure healthy lives and promote well-being for all at all ages	Air pollution from traditional biomass usage is a prime cause of premature deaths, particularly amongst women and children	3.9
4	Ensure inclusive and equitable quality education and promote life-long learning opportunities for all	Basic energy services are required to deliver education	4.1, 4.3, 4.6
5	Achieve gender equality andempower all women and girls	Women's use of traditional biomass methods for cooking puts their health at risk	5.4
6	Ensure availability and sustainable management of water and sanitation for all	Conventional forms of power generation have substantial water requirements	6.1, 6.3, 6.5, 6.6
8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	The energy intensity of economic growth needs to be reduced	8.1, 8.3, 8.4, 8.5
9	Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation	Resilient grid and transport infrastructure across borders is required to ensure access to energy for all, and to maximise energy efficiency	9.1, 9.2, 9.4, 9.5, 9a
10	Reduce inequality within and among countries	Distributed generation brings potential to genuinely provide energy to all, including in remote rural areas, thus reducing inequalities	10.1
11	Make cities and human settlements inclusive, safe, resilient and sustainable	Cities require careful energy planning – especially to minimise combustion-driven air pollution for residents	11.1, 11.2, 11.6, 11.b
12	Ensure sustainable consumption and production patterns	Renewable energy and energy efficiency are a key part of a future in which there is sustainable consumption	12.1, 12.2, 12.8, 12.a, 12.c
13	Take urgent action to combat climate change and its impacts	The carbon-intensive energy sector is a key driver of climate change	13.2, 13.3, 13.a
14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development	The ocean space can be used for marine energy (e.g. offshore wind)	14.2, 14.5, 14.7, 14.c
15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradationand halt biodiversity loss	Energy projects need to be carefully sited and the energy mix needs to be carefully planned to avoid a negative impact on ecosystems and biodiversity	15.1, 15.2 , 15.9
16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	Transparent and corruption-free regimes are key to delivering energy services affordably	16.1, 16.5,16.6, 16.7,16. B
17	Strengthen the means of implementation and revitalise the global partnership for sustainable development	Finance is required for capex-heavy energy infra- structure investments, Free trade will help to ensure affordability	17.3, 17.5, 17.6, 17.7, 17.8, 17.10, 17.12, 17.14, 17.15, 17.16, 17.19

Source: ICSU, ISSC (2015), p.41.

Annex

Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all: Targets and Indicators	
7.1 By 2030, ensure universal access to affordable, reliable and modern energy services	7.1.1 Proportion of population with access to electricity 7.1.2 Proportion of population with primary reliance on clean fuels and technology
7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1 Renewable energy share in the total final energy consumption
7.3 By 2030, double the global rate of improvement in energy efficiency	7.3.1 Energy intensity measured in terms of primary energy and GDP
7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	7.a.1 Mobilized amount of United States dollars per year starting in 2020 accountable towards the $100 billion commitment
7.b By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States and landlocked developing countries, in accordance with their respective programmes of support	7.b.1 Investments in energy efficiency as a percentage of GDP and the amount of foreign direct investment in financial transfer for infrastructure and technology to sustainable development services

8

Enabling Sustainable Development: Challenges to Job Creation in India

Introduction

India's economic growth increased very significantly after major economic reforms began in 1991. Between 1950 and 1980 the growth rate was 3.5 per cent per annum; it rose to 5.4 per cent per annum in the 1980s. However, since the economic reforms began it has risen further to 6.4 per cent, and then between 2003-4 and 2011-12 it averaged 8.4 per cent per annum (having fallen since then). However, there has been a disconnect between economic growth and job growth in India.

Open unemployment[1] has remained stable (at just over 2 per cent per annum) in India – only because open unemployment is only an option for the relatively well-off – since the vast majority are too poor to survive without working, even if it is only a few months in a year. Thus 53.2 per cent of the rural workforce in 2013-14 got work for 12 months in the year, but 42.2 per cent of it worked only between 1-5 months; the remainder worked even less than a month. In urban areas, 78.5 per cent of the workforce worked for 12 months, while 16.3 per cent obtained work only for 1-5 months; the remainder worked for less than a month.[2]

A credible strategy for achieving inclusive growth in India requires an understanding of the limitations of India's unprecedently high economic growth experienced in the last decade (averaging 8.4 per cent per annum over 2003-4 and 2010-11). One limitation of the growth process has been the relative stagnation of agriculture and the rural distress. The other is the rather slow rate of structural transformation with industry not growing as rapidly as services,[3] and manufacturing certainly not emerging as the leading sector of the economy (Goal 9 of the SDGs become very relevant to the achievement of Goal 8 in this context). Underlying these phenomena is the large disconnect between economic growth and job growth. In fact there are several major paradoxes in India's economic growth story especially related to non-agricultural employment that act as barriers to ensuring inclusiveness in growth.

We define inclusive growth as being one where output growth is accompanied by employment growth, especially in non-agricultural occupations, even though employment growth may be proportionally lower than output growth in a given period.[4] Besides most non-agricultural employment growth is taking place in informal jobs in unregistered enterprises. This is the first paradox which is discussed in the first section of this paper.

There is a second paradox. Mainstream economic theory assumes that a rise in the rate of output growth will be accompanied by a rise in employment growth, unless accompanied by a still greater rise in rate of growth of labour productivity (the Kaldor-Verdoorn law).[5] Besides, a prediction of mainstream trade theory (of the neo-classical type) is that as a labour-abundant economy opens up to international trade (as India did post-1991 economic reforms), it will export labour-intensive commodities, and thus display a shift in the output composition that is more labour-intensive. One also assumes that with rapid economic growth, especially in a large diversified economy like India's, GDP growth would be accompanied by growth in non-agricultural employment, especially in manufacturing and in services. The period 2004/5-2009/10, however, which is an unprecedented period in terms of GDP

growth in the history of post-independent India, was accompanied by an absolute decline of 6 per cent in employment in manufacturing, and a mere 7 per cent increase of employment in services (and that too mostly in traditional, as opposed to modern, services). So clearly the prediction of mainstream economic theory is not being realised. This paradox, addressed in section 2, is worrying because under-25 years olds constitute half of India's population, and two-thirds of Indians are under 35 – most of whom will expect to find jobs in non-agricultural sectors. However, we will show that non-agricultural employment growth picked up rapidly between 2009-10 and 2011-12, the reasons for which will be discussed, which also suggest a way forward for employment growth in industry and services for India, so that Goal 8 of SDGs can be realised by India.

A third paradox, addressed in section 3, is that, unlike other emerging market economies, India has seen a decline in labour force participation rates (LFPR) of women, despite growing per capita incomes. In fact, like its South Asian neighbours, India has one of the lowest female LFPR in absolute term (less than half for China), which instead of increasing (as it normally does, after a certain point, with rising per capita incomes), has been falling.

Let us reiterate an urgent challenge that the world faces in respect of SDGs. SDGs will not be realised by 2030 if India does not achieve economic growth with job growth. An important reason why the poverty MDG was achieved by the world by 2015 was the Chinese growth story, accompanied by job growth. It achieved this goal because China's policymakers rode the wave of their demographic dividend, and took advantage of it by creating jobs with growth. India's policymakers face a bigger challenge, as the employment elasticity of output in India had been falling till 2010 (though it rose somewhat by 2012). If the SDG on poverty will be achieved by 2030, it will now be because of India's reducing poverty by realising its demographic dividend (i.e. repeating the Chinese success story of 1990- 2005), a task that is impossible without increasing the employment elasticity of non-agricultural output increase.

India is at a critical mid-point of its demographic dividend. Demographic dividend is defined as a rising share of the working age population in the total population, with a corresponding falling share of non-working, dependent population which is either below 15 or over 60 years of age. The youth entering the labour force must get jobs in the non-agricultural sector for the demographic dividend to be realised. In other words, the paradoxes of India's recent phase of economic growth must disappear with time, not intensify. The final section discusses the policy implications.

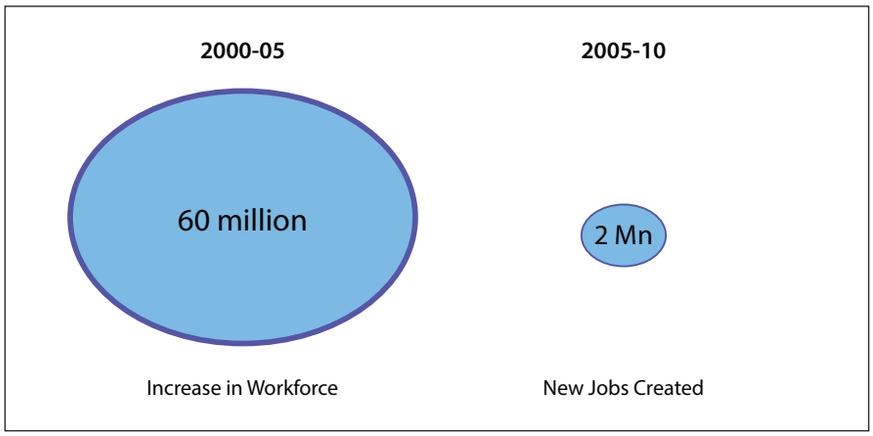
The First paradox: Why Output Growth has Reduced Poverty – but Slowly?

With output growth outside of agriculture there should be employment growth as well. However, we find that during the first half of the 2000s (i.e. 2000-2005) the work force increased by around 60 million, but in the latter half of the decade (i.e. 2005-10) the increase in the number of jobs was merely 1 to 2 million in the country as a whole, even though the latter was a period of unprecedented economic growth in India's history. Such volality has implications for the elasticity of poverty reduction to output growth. In other words, it impacts the inclusiveness of GDP growth.

Economic growth since the early 1980s has been co-related with a decline in the head count ratio of poverty. However, it is equally noticeable that the elasticity of poverty reduction to GDP growth is much lower in India than, say China: - 0.8 in China for the period 1981-2005 versus - 0.3 for India over 1993-2005 (Ravallion and Dutt, 2009).[6]

Our theoretical framework of synergies (Mehrotra and Delamonica, 2007; Mehrotra, 2016; Institute of Applied Manpower Research, 2011) would suggest that there were several reasons for this lower elasticity of poverty reduction. First, the initial conditions in terms of human functioning – health, nutrition and education – were much worse in India than in China. A second reason was that GDP growth was lower in states where a large proportion of India's poor reside. Finally, and most importantly for our analysis in this paper, the sectoral composition of India's growth has resulted in fewer productive jobs for the poor (Hasan, 2013).

Figure 1: Workforce-Jobs Mismatch in India



Source: Author's Compilation.

Most employment growth has been in unorganised enterprises/informal jobs. India is an outlier among middle-income countries in having 93 per cent of its total workforce in informal jobs, and 78 per cent of the workforce in enterprises that are defined as unorganised.[7]

There is another paradox of Indian firms. Most output in industry and services is produced by organised enterprises, but most employment in the secondary and tertiary sectors is in unorganised enterprises.[8] Not surprising, therefore, that the contribution of the tiny unorganised segment enterprises (whether in services or manufacturing) has been low.

Consistent with the above, the unregistered manufacturing sector employs about four-fifths of the workers in manufacturing. These unregistered enterprises are small, and are usually very labour-intensive, producing low quality goods using traditional technologies, and are characterised by low productivity. By contrast, registered manufacturing tends to be skill-and-capital intensive. For the manufacturing sector in 2005, 99 per cent of establishments were in the unorganised segment. By contrast only 51 per cent of the US establishments have less than 10 employees (Ghani *et al.*, 2013). Of course there are some variations by state and by industry/sector across India. The shares of unorganised sector in total employment in the states are higher than 85 per cent (across six surveys) in four states, viz. Bihar, Orissa and West Bengal, but lower than 70 per cent in more developed states like Gujarat, Haryana, Maharashtra and Punjab.

The paradox we are emphasising here is that even with rapid GDP growth this segmentation in the labour market and product market, and the duality in respect of enterprise size/productivity, is not showing much signs of change. Using National Sample Survey (NSS) data, the unorganised segment's share of non-agricultural employment was 88 per cent in 1999-2000, and fell only gradually to 78 per cent in 2011-12.

The Second Paradox: Output Growth Sustains, but Manufacturing/Services Employment Does Not

With rapid economic growth usually occurs an increase in productivity. There are normally two sources of such productivity increase. One derives from the shift of labour from low-productivity agriculture to relatively higher productivity economic activities in manufacturing and services. A second source of productivity increase is derived from 'total factor productivity' (TFP) which refers to improvements in output for reasons other than increases in inputs of capital or labour. In other words, it refers to the techniques by which labour and capital combine and usually it is estimated as a residual of increase in output that cannot be explained by increases in physical quantities of labour and capital. We know that TFP has been increasing over the last decade (Kumar and Subramanian, 2011). In the first half of the decade of 2000s, employment in manufacturing increased by 25 per cent (from 42 to 53 million), and in services from 90 to 107 million. This was also a period of rapid non-

agricultural output growth. However, remarkably employment in manufacturing fell in absolute terms by 7 per cent (from 54 million in 2005 to 51 million in 2010). It also increased by a slow 9 per cent for the same period in services (from 107 million to 116 million). In other words, growth in gross value added of manufacturing and services was accompanied by slow growth in employment (Mehrotra *et al.*, 2012a; Mehrotra *et al.*, 2012b; Mehrotra *et al.*, 2014).

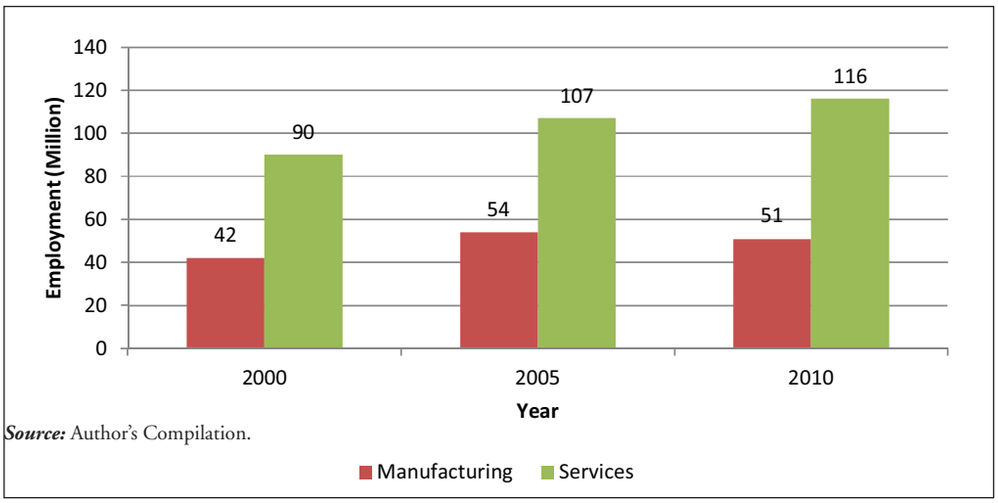
The root cause of the relatively poor performance of manufacturing in the 25 years since the post-1991 reforms, despite much faster economic growth compared to earlier decades, was the absence of industrial policy (the modern day meaning of such a policy is discussed in the next section). However, there were other contingent factors at play since 2005. This decline in manufacturing employment between 2005 and 2010 was the result of two sets of factors: rising capital-intensity of manufacturing (itself driven in turn by rising wages and rising import-intensity of manufacturing); and a fall in manufactured exports following the global economic crisis that had resulted in collapse of international demand. Both these factors have resulted in a shift in the driving forces behind manufacturing employment after 2009-10.

As we argue elsewhere (Mehrotra *et al.*, 2014), manufacturing employment grew rapidly between 2009-10 and 2011-12, which were also years of rapid economic recovery post economic crisis. There are lessons for the future from this recovery. The fall in international demand also turned the attention of domestic producers towards new sources of rising domestic demand. The period since 2004-5 was characterised by rising wages, and hence a dramatic fall in poverty. The share of the poor in the population had been falling for decades, but never in India's history had there been a fall in the absolute number of the poor. However, the numbers of the poor fell by nearly 140 million in seven years (2004-5 to 2011-12), or at a rate of 20 million per annum. This generated a very large new source of demand for simple manufactured consumer goods (leather, textiles, garments, processed food, furniture, mobiles). These were precisely the product groups that saw a sharp rise in employment, as most of the consumer goods consumed by the new non-poor are low quality goods produced by the unorganised manufacturing sector (Mehrotra *et al.* 2014). The rise in domestic demand, driven by rising wages, holds out lessons at a time when international demand for India's exports has been falling. Make in India should be 'Make for India'.

The Third Paradox: Falling Female Work Participation while Economic Growth is Fast

With rise in per capita income, which has been unprecedented in the last decade in India one would expect the labour force participation rate (LFPR) of women would rise. The paradox is, however, that women's LFPR has been declining. South Asia is unusual among developing regions of the world, as it has one of the lowest LFPRs for women. Since the 1980s there is a near consistent decline in work participation rates for women in India (Mazumdar

Figure 2: Manufacturing – Services Employment (2000-10) in India



Source: Author's Compilation.

and Neetha, 2011; Rangarajan *et al.*, 2011). As per capita incomes rise the experience in most other developing regions is that the LFPR of women increases. For example, China and Brazil, two other BRIC economies, have an LFPR for women of 68 per cent and 59 per cent, respectively, for the age-group 15+, while for India it is only 23 per cent, and falling.[9]

So the third and final paradox of the Indian economic growth story is that while the per capita income has been rising in both rural and urban areas, women were withdrawing from the labour force. This is consistent with the overall South Asian experience, but very different from major emerging market economies like Indonesia and Brazil. In the latter, there is a positive co-relation between LFPR of women 15+ and the gross national income per capita. However, as a cross section analysis of the female LFPR with the log of GDP per capita shows the LFPR in India is expected to rise for women very shortly, given their rising participation in schooling.

Addressing the Disconnect between Economic Growth and Job Growth

The first paradox of slow job creation, and of most employment generation with economic growth occurring in the unorganised segment of industry and services, is a structural problem. This requires a serious industrial policy, of which the following should be key components: addressing the missing middle; labour law reform; skill development on a scale and a level of quality unseen so far; and measures to raise the female labour force participation rate, and finally, a focus on key strategic sectors in manufacturing policy.

The Missing Middle: Minimising the Disincentives for Growth of Firms

The distribution of Indian firms is characterised by the missing middle: a very large number of tiny firms, and a small number of large firms. NSS data on non-agricultural workers shows that as many as 64 per cent non-agricultural workers (in 2011-12) are employed in enterprises hiring less than 6 workers. Invariably most of these enterprises are either micro or small enterprises. The data from the Fourth All India Census of Micro, Small and Medium Enterprises (2006-07) shows that of the 1.6 million registered and 19.9 million unregistered enterprises, micro enterprises accounted for 95 per cent and 99 per cent of enterprises respectively.[10] This has also been corroborated by the Economic Survey 2013 which states that in India too many small firms continue to stay small and unproductive and are not allowed to die gracefully. Smaller enterprises prefer to remain under the regulator's and taxman's radar, lack competitiveness, suffer from low productivity and are unable to generate productive employment. Meanwhile the large profit-making firms choose to hire temporary contract labour and employ machines rather than train workers for longer-term jobs in order to avoid rigidity on account of labour regulations. This is reflected in rising informalisation in organised sector employment. Both these characteristics of firms have implications for employment generation.

The dominance of micro enterprises, both in the registered as well as unregistered segments, seems to be voluntary because that way they can avoid regulations (labour, pollution control) and taxes. In addition, firms in unregistered or unorganised sector also face credit constraints, preventing them from growing bigger. But the voluntary or policy-induced dimension of the missing middle cannot be ignored. On the other hand, firms employing larger number of contract or temporary workers have little incentive to invest in training and skill upgradation of their employees and improving productivity.

The problem of the missing middle is essentially policy-induced and began in the 1950s with a process of reserving a host of products for small scale industries (SSI). The process of reservation of products that could only be produced by SSIs continued until the early 1990s, such that as many as 836 products were reserved for SSIs. Even in 2005, 500 products were reserved for SSIs. Thus, on the one hand, support was given to the SSIs and, on the other, large scale public enterprises in the capital goods sector were promoted. This resulted in the missing middle within the industrial sector.

However, it took nearly two decades for the process of de-reservation to be completed. Now only 14 products are reserved for small units. Nevertheless, the reservation list elimination has been replaced by an equally counter-intuitive policy, which actually disincentivises firms from growing.

There is an inbuilt disincentive system facing the micro and small enterprises to invest in more than Rs. 5 crore of capital (which would make them medium

sized firms). The criterion of investment in plant and machinery is used to determine whether a firm belongs to the category of micro, small or medium enterprise (MSME). There are both financial and non-financial incentives and benefits from the various government schemes for the first two categories: micro and small enterprises (MSEs).[11]

These financial and non-financial incentives for MSEs are such that if a firm decides to grow by investing in plant and machinery so that its total investment rises above Rs. 5 crore (i.e. it becomes a medium enterprise), it loses almost all these benefits. Similarly, service sector firms are also dis-incentivised from growing. Service tax exemptions for firms with less than Rs. 10 lakh revenue, and exemption from central excise duty for firms with an annual turnover of less than Rs. 1.5 crore, are examples of some of these schemes which act as a disincentive for service sector firms to grow (Economic Survey 2012-13). In response to this criticism, in 2013 the MSME Ministry (that provides these incentives) decided that the incentives offered micro/small enterprises will continue for three years of their investment increase beyond Rs. 5 crore.

Labour Regulations: Addressing Labour Laws as a Constraint on Firm Growth

Quite apart from the government's own financial and non-financial incentives to small firms to remain small, there are other constraints on employment growth, with respect to larger organised sector enterprises. Labour laws and other regulations have often hindered expansion of employment in organised manufacturing. There are 45 different national and state-level labour laws in India (Panagariya, 2008). Labour laws apply in practice mainly to the organised sector.

Hence, we have argued elsewhere (Mehrotra *et al.* 2014) that the presence of this legislation for 36 years (the threshold limit of such firms was 300 workers in 1976, which became 100 workers in 1982) has affected industrial structure in the sense that the size class of enterprise is skewed towards those with fewer than100 workers. We find that the fact of the missing middle can also be established using Annual Survey of Industries (ASI) data which shows a distinct discontinuity, at the cut-off of firms employing 100 and above workers. Factories employing less than 99 workers are about two thirds of all factories surveyed under ASI, of which almost 36 per cent of all factories employ less than 14 workers. A remarkable 84 per cent of all factories employ less than 100 workers. The cliff at 100+ workers is visible with a sharp fall in the percentage of factories with over 100 workers. Concerted efforts are needed to support transition of smaller enterprises to medium ones with government support or tax incentives.

Improving Employability: Skills and the Link to Raising Women's Labour Force Participation in Industry and Services

The continuing low and declining labour force participation of women, completely contrary to the experience of other emerging market economies, holds out a challenge to policymakers. In time, probably within the next five years, the LFPR of women will increase, primarily because increasingly better educated girls, unlike their mothers who worked in home-based enterprises or on own account (Mehrotra and Biggeri, 2007), will want to join formal and informal employment in nearby towns and cities.[12] The challenge for both public and the private sector is to skill them, to enable them to become employable in industry and services, since unlike their parents they would want to leave rural areas behind – a phenomenon that has characterised most middle-income countries in both Latin America as well as South-East Asia (World Bank, 2012). When the labour force participation rates of women start to increase instead of falling could well be a turning point in the economic and social history of India, given the historical and systematic gender discrimination that has prevailed in India. Women's participation in non-agricultural occupations has historically been associated with economic growth as well as high social achievement (Mehrotra, 1997; Sen, 2000).

Improving the Employment-intensity and Competitiveness of Manufacturing

The lack of an industrial policy since economic reforms has been a root cause of poor manufacturing performance in India.[13] Unlike other developing countries that were successful with industrial growth with job growth (and unlike countries, mostly in Latin America which were less than successful), India has not had an industrial policy ever since economic

reforms began. The successful countries – all in East and South East Asia – all had an industrial policy. The most well-known are Japan (where industrial policy was led by the Ministry of Trade and Industry MITI), China (where the process was led by the State Planning Commission and its successor, the National Development and Reforms Commission), and all East/ South East Asian countries, without exception.

This recognition is already reflected in the commitment in the 12th Five Year Plan that targets increase in manufacturing gross value added increase rapidly from its current share of 15 per cent of GDP to 25 per cent by 2022, but employment in manufacturing should also grow significantly, possibly by an additional 100 million by 2025 (Planning Commission, 2013). The new Union Government's focus on 'Make in India' is therefore welcome. Given the fact that manufacturing employment grew by only 21 million workers between 1993-4 and 2011-12 (or 19 years), the challenge of increasing employment in manufacturing by even 50 million (within 10 years) is monumental. This is particularly difficult since technical change globally is increasingly labour-saving. However, one should focus on the positive dimensions. First, there has been an increase since 2005 of the terms of trade of agriculture (which had been flat between 1990-91 and 2004-05) (Balakrishnan, 2010). The ratio of price of food to non-food articles between December 2006 and September 2011 was 1.14 (Moorthy and Manur, 2013. We had already seen that real rural wages had risen rapidly since 2005 (a trend initiated by MNREGA), as had consumption expenditure. The result has been a unique new development in Indian economic history, in that the predominant source of consumption demand shifted from urban to rural areas.

This shift has several consequences, which have implications for government policy. First, this shift in consumption pattern and growth in rural demand (after 2006 rural non-farm income went up from its 50 per cent share in total rural income to over 60 per cent) can be sustained provided that investment in rural infrastructure is sustained. The Pradhan Mantri Gram Sadak Yojana/PM's Rural Roads Programme (PMGSY) has seen sustained investment. Rural roads will continue to generate rural incomes, and along with pucca housing construction, can generate jobs in rural areas outside of agriculture. Secondly, since it is the small-scale and micro-enterprises that supply manufactured goods for rural citizens, their access to credit will need to be increased significantly.

However, after the National Manufacturing Policy (2011), the first since the economic reforms began in 1991, there are further actions that may be required:

- The tariff policy in India is inconsistent with manufacturing goals. This requires many changes: (i) there had been too dramatic a reduction of tariff rates from 1997 onwards which too suddenly affected the competitiveness of India's large industries which had developed within protective barriers; hence the sudden exposure led to premature de-industrialisation[14]; (ii) India's small industries were affected heavily as they had been over-protected (both from international competition or from domestic large scale producers), due to reservation of products exclusively for them; and (iii) The inverted[15] import duty structure affected the domestic capital goods sector that makes a range of Indian manufactures (those dependent on imported raw materials) uncompetitive in price terms.
- The Micro, Small, and Medium Enterprises in particular will need support, but in ways that are radically different from those followed in the first 50 years after independence.
    - A serious policy for development of modern industry clusters has to be put in place, which requires a focus on brown field (not just green field) sites.
    - Cluster Development programme, that took off only in 2005, will need much more than the Rs. 3000 crores per annum (or US$ 500 million at 2014 exchange rates) for the 6000 clusters in India. This money will be required for three types of services – technology upgradation, market information facilitation, and design improvement. The MSME and other central government sectoral ministries (textiles, food processing, etc.) do provide some services, but nowhere near the required scale.
    - The Small Industries Development Bank of India (SIDBI) provides finance for the industry clusters . The public sector banks'

are diffident in lending to micro and small establishments (on account of several reasons such as lack of trust, low capacity of firms to prepare bankable projects and the high transaction costs of dealing with a large number of small borrowers). The Finance Minister has set a target of Rs 1.22 lakh crore for loans to be given by state-run banks to promote new entrepreneurs under the Pradhan Mantri Mudra Yojana (PMMY).

- There are specific interventions that are required in the field of infrastructure. Modern industry clusters cannot grow without better infrastructure. Given the fact that 99 per cent of unregistered and 95 per cent of unregistered enterprises are micro-enterprises, they are likely to be concentrated in the small towns (less than 0.5 million) and nearby villages. It is the brownfield sites of the 1100 modern clusters that must grow for manufacturing output/employment to expand in India, which requires public investment in infrastructure – both physical and social – that must focus on the middle-tier cities instead of its mega and large cities.

The Government of India's AMRUT programme (Atal Mission for Rejuvenation and Urban Transformation) plans to spend Rs. 48 000 crore on 500 cities (over 5 years starting 2015-16). What is important is that the cities/towns chosen are such that the Cluster Development Programme of MSME is also implemented in such a town. It is also critical that there is synergy in the planning for the Cluster programme and the AMRUT programme, so that the objective of job creation is one of the outcome objectives.

To conclude, the implementation framework to be adopted by India in fulfilling the SDG 8 must have the above policy priorities. The government of India, as noted above has a major facilitating and regulatory role ahead. The Government's main financing responsibility will be in respect of infrastructure funding, but even here the 12th Five Year Plan had predicted that the financing share will be 50:50, although during the 11th Plan period it was 38:62, with the larger responsibility being that of state governments. Therefore, pension and insurance funds must become a source of long-term infrastructure financing, in order to reduce the reliance of bank funding for infrastructure.

Endnotes

1 Open unemployment is defined as the difference between the size of the labour force (those making themselves available for work) and the workforce (those from the labour force who are actually working). In India these definitions are based upon the size of the labour force defined as those working on principal status of employment (more than 182 days in the year) and subsidiary status (those working between 30 and 181 days in the year). MGNREGA workers will be counted usually in subsidiary status work, though since most states don't generate more than 30 days of work in the entire year for the household (as opposed to an individual), it is unlikely to get counted.

2 Analysis based on the Labour Bureau survey of 2013-14.

3 Services grew faster than industry in every Plan period since the economic reforms began (Planning Commission, 2013). Only during the 8th Plan (1992-3 to 1996-7) did the two grow at the same rate (see Mehrotra, 2016, chapter 2).

4 There is no expectation that the two will grow proportionately, as then productivitiy would be stagnant, with the risk of per capita income falling.

5 The Verdoorn law states that there is a close positive relationship between the long-run rate of growth of manufacturing productivity and the long-run rate of growth of manufacturing output. Kaldor studied the Verdoorn relation using cross-country data at the sectoral level for 12 advanced countries from the mid-1950s to mid-1960s. He estimated that the Verdoorn coefficient at the aggregate economy-level of one-half, i.e. a 1 per cent increase in output requires a 0.5 per cent increase in labour and is associated with a 0.5 per cent increase in rate of growth of productivity.

6 The good news is that the rate of poverty reduction was much faster in the period since 2004-5, with the poverty incidence falling at twice the rate than it fell in the preceding decade. This improvement in the rate of poverty reduction was mainly due to rise in real wages driven mainly by construction employment for those leaving agriculture, i.e. for those at the bottom of the pyramid. The next phase of economic growth must now focus on job growth in manufacturing as well as modern services, in addition to construction.

7 Informal employment is normally contractual (as opposed to regular), and does not come with social security. Organised segment enterprises usually employ less than 10 workers (if employing electricity, and more than 20 if without electricity), and most such enterprises are unregistered with government.

8 Some people think that this is nothing unusual, and that even in Europe and the US small and medium enterprises account for most of the employment. However, this is an inappropriate comparison, because in India it is the micro-enterprises (employing less than 10 workers or unorganised units), with most within this category consisting of own-account, single person establishments, that predominate. In that sense, the comparison with the European employment structure by size of enterprise does not begin to appreciate the depth of the problem of the missing middle in India.

9 See Mehrotra and Sinha (2015) for a detailed analysis of the reasons for falling female labour participation in India.

10 This census uses the size of capital investment as the basis for

cut-offs: less than Rs.2.5 million is micro; between Rs. 2.5 – Rs. 50 million is small; medium is between Rs.50 and Rs. 100 million; and more than Rs.100 million capital investment makes the firm large.

[11] The non-financial incentives consist of assistance aimed at processes, design and technology. In addition, the government needs to procure 20 per cent of annual value of goods and services from MSEs and 358 items are reserved for exclusive procurement by the government from MSEs. Micro and small enterprises are entitled to these benefits which they have to forego if they graduate to medium enterprises, a disincentive structure which has been built into policy to promote and protect small scale enterprises.

Also, there are financial incentives for MSEs: a credit guarantee for collateral free loan for loans up to Rs.1 crore; training and technology grant of 75 per cent of projects cost; tangible assets and infrastructure grant of 80 per cent of project cost; reimbursement of 75 per cent for ISO certification expenses up to maximum of Rs.75,000; and the Small Industries Development Bank of Industry (SIDBI) support for NGOs; and micro finance institutions to provide loans to MSEs.

[12] For a further analysis of what policy instruments the state has in order to increase female labour force participation, see Mehrotra and Sinha (2016).

[13] It is obvious we don't want to repeat the mistakes of the pre-1991 versions of industrial policy. However, there is much that can be done which does not repeat those mistakes, and yet goes beyond the 'liberalise, de-regulate and open up to world markets' mantra repeated ad nauseum for the last quarter century.

[14] In fact, in 1998 Jagdish Bhagwati is believed to have made a statement stating as such, that while tariff reductions by India were needed, the speed at which India reduced its tariffs were unwarranted by requirements of WTO. Although the share of manufacturing in GDP has not declined in India, it has not risen either: this is in contrast to the situation prevailing in East Asia.

[15] The import duty applicable on finished products is lower than the import duty on the raw material or intermediate products which discourages domestic value addition.

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Annex

Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all: Targets and Indicators	
8.1 Sustain per capita economic growth in accordance with national circumstances and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries	8.1.1 Annual growth rate of real GDP per capita
8.2 Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors	8.2.1 Annual growth rate of real GDP per employed person
8.3 Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small-and medium-sized enterprises, including through access to financial services	8.3.1 Proportion of informal employment in non-agriculture employment, by sex
8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programmes on Sustainable Consumption and Production, with developed countries taking the lead	8.4.1 Material footprint, material footprint per capita, and material footprint per GDP 8.4.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP
8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value	8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities 8.5.2 Unemployment rate, by sex, age and persons with disabilities
8.6 By 2020, substantially reduce the proportion of youth not in employment, education or training	8.6.1 Proportion of youth (aged 15-24 years) not in education, employment or training
8.7 Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms	8.7.1 Proportion and number of children aged 5-17 years engaged in child labour, by sex and age

8.8 Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment	8.8.1 Frequency rates of fatal and non-fatal occupational injuries, by sex and migrant status 8.8.2 Increase in national compliance of labour rights (freedom of association and collective bargaining) based on International Labour Organization (ILO) textual sources and national legislation, by sex and migrant status
8.9 By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products	8.9.1 Tourism direct GDP as a proportion of total GDP and in growth rate 8.9.2 Number of jobs in tourism industries as a proportion of total jobs and growth rate of jobs, by sex
8.10 Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all	8.10.1 Number of commercial bank branches and automated teller machines (ATMs) per 100,000 adults 8.10.2 Proportion of adults (15 years and older) with an account at a bank or other financial institution or with a mobile-money-service provider
8.a Increase Aid for Trade support for developing countries, in particular least developed countries, including through the Enhanced Integrated Framework for Trade-related Technical Assistance to Least Developed Countries	8.a.1 Aid for Trade commitments and disbursements
8.b By 2020, develop and operationalize a global strategy for youth employment and implement the Global Jobs Pact of the International Labour Organization	8.b.1 Total government spending in social protection and employment programmes as a proportion of the national budgets and GDP

9
Industrialisation, Innovation and Infrastructure for Achieving SDGs in India

Introduction

The Sustainable Development Goals (SDGs) involve a significant step forward from the Millennium Development goals (MDGs).Drawn from the Rio+20 outcome document, – the Future We Want – the goals are intended to advance sustainable development through greater integration of its three pillars: economic, social, and environmental. Apart from having a broader perspective, the SDGs have explicitly recognised the key roles of science, technology innovation (STI), along with information and communications technology (ICT), industrialisation and infrastructure. This is evident from goal 9, which calls for building resilient infrastructure; promote inclusive and sustainable industrialisation and foster innovation.

While dealing with SDG 9, it needs to be noted that the relevance of the Goal as well as the targets therein, in the Indian context, cannot be overemphasised. For focussed discussion the targets specified under Goal 9 may be grouped to:

- Building up of an internationally competitive, socially inclusive and environmentally sustainable manufacturing sector;
- Strengthening STI capability at all levels;
- Harnessing ICT for development; and
- Building resilient infrastructure.

In what follows, we shall, discuss each of these objectives in some detail keeping in view the national policies and programmes in these areas.

Inclusive and Sustainable Industrialisation

It may not be an exaggeration that India's efforts overtime through various policy initiatives and institutional interventions to build a manufacturing base has been remarkable. The focus of these initiatives in the earlier period was to build a regionally balanced and diversified industrial base at the instance of public sector and increased role for the small-scale sector under the umbrella of protection and regulation. Over the years and especially after 1991 the focus has shifted towards evolving an internationally competitive industrial sector with greater integration with the world market. This implied *inter alia* dismantling of barriers to manufacturing, trade and investment (both foreign and local) along with the removal of reservations for the Micro, Small and Medium Enterprises (MSMEs). These initiatives, needless to say, have paid rich dividend as is manifested in the marked increase in the inflow of industrial investment, both local and foreign, and in high growth in the manufacturing output. Nonetheless, India's performance in the manufacturing sector lagged behind when compared to that of the service sector and also in comparison with China and some of the South-East Asian countries. To be more specific, while the share of manufacturing sector in GDP increased from about 9 per cent in 1950-51 to about 15 per cent by 1990. During the last 25 years after globalisation, the share of manufacturing sector in GDP has shown a marginal decline. This has to be compared with over 30 per cent share of the manufacturing sector in GDP in countries like China and South Korea.

As per the data released by the Department of Industrial Policy and Promotion (DIPP), there has been a marked increase in the inflow of foreign direct investment (FDI) into the country after 1991. India's share in global FDI was only 0.1 per cent by 1990 and by 2009, the share increased to 3.1 per cent. Similar trend could be seen in terms of the share of FDI in GDP that remained less than 1 per cent until 1990 and in recent periods it has been as high as 3.2 per cent. From the perspective of FDI contribution in filling the saving investment gap, it is evident that its share in gross fixed capital formation increased from a very low level of 0.5 per cent in 1970 to over 9 per cent. However, as per the DIPP data the patterns of FDI inflow have been inimical to the objective of achieving balanced regional development. The distribution of FDI into different states indicates that one of the states, Maharashtra, accounted for 36 per cent of the total FDI into the country during 2006-10 (up from 22 per cent during 2000-05). More specifically, while the share of four leading states was about 59 per cent during 2000-05, it increased to 66 per cent during 2006-10. The sectoral composition of FDI in India has also undergone significant change. Studies have noted that during the pre-liberalisation period the bulk of FDI was directed to manufacturing sector but in the post-liberalisation period FDI inflows have been received mainly by the service sector. Share of services, housing and construction in total FDI inflow had been only 8 per cent during 1990-99 which increased to over 41 per cent during 2006-10. Scholars have also indicated that there is an increase in the share of FDI taking place through mergers and acquisitions (M&As). In recent years two-fifths of all FDI inflows took the form of mergers and acquisition as compared to virtually all FDI inflows for greenfield ventures earlier (Kumar, 2000; Beena, 2014).

The share of manufacturing Gross Value Added (GVA) in the total value of output has gradually declined from a peak of 24.9 per cent in 1996-97 to 17.8 per cent in 2010-11. The declining share of manufacturing value added had its implications on the share of labour. When it comes to share of labour in manufacturing value added, it declined from 40.6 per cent in 1980-81 to 22 per cent in 2010-11. This cannot be de-linked from the increasing incidence of contract labour in the organised manufacturing sector that increased from about 14.5 per cent in 1993-94 to over 26 per cent in 2004-05 (Uma, Abraham and Joseph, 2010). However, the share of profit in value added in the organised manufacturing sector recorded a remarkable increase from 18.5 per cent in 1991 to 53.8 per cent in 2007-08 before moderating to 47.8 per cent in 2010-11. The declining share of wages and increase in the share of profit tend to suggest a process of immiserising competitiveness with implications for inequality and social exclusion.

Manufacturing Policies and 12th Five Year Plan Strategy

The National Manufacturing Policy, which was introduced in 2011, called for a paradigm shift in the manufacturing sector with following specific objectives:

- Increase manufacturing sector growth to 12-14 per cent over the medium term to make it the engine of growth for the economy by enabling manufacturing sector to contribute at least 25 per cent of the National GDP by 2025;
- Increase the rate of job creation in manufacturing to create 100 million additional jobs by 2025 with emphasis on the creation of appropriate skill sets among the rural migrant and urban poor to make growth inclusive;
- Increase 'depth' in manufacturing, with focus on the level of domestic value addition;
- Enhance global competitiveness of Indian manufacturing through appropriate policy support; and
- Ensure sustainability of growth, particularly with regard to the environment.

Moving forward from the National Manufacturing Policy 2011, the manufacturing strategy for the 12th plan specified a development strategy by focussing on broad industrial groups and specific industries therein. The key strategies encompassing cross-sectoral themes against the backdrop of the major challenges being faced by the manufacturing sector, specified in the 12th plan are the following:

- Technology and depth given the declining value added in manufacturing sector;

- Human resources development considering the skill constraint in fostering manufacturing sector
- Business Regulatory Framework (BRF) considering the various hurdles in the existing policy framework and to enhance the ease of doing business;
- Environmental sustainability by considering the adverse impact of different manufacturing sectors;
- Addressing land and water related issues, recognising the various issues relating to the availability of land and water for industrial development;
- Clustering and aggregation for reaping economies of scale and scope along with facilitating interactive learning;
- Promoting Micro, Small and Medium sized Enterprises (MSMEs) considering their significant role in manufacturing output and export earning, balanced regional development, and employment generation, among others;
- Boost manufacturing exports, reforming the role and management of public sector enterprises (PSEs); and finally
- The establishment of National Investment and Manufacturing Zones (NIMZs).

The 12th plan strategy has articulated cross cutting issues at four broad categories. The broad categories of industries are: (a) Sectors of strategic importance (covering defence equipment, aerospace, capital goods, and ship building and ship repair); (b) Sectors for basic inputs (that include steel, cement, fertilisers, exploration and development of minerals); (c) Sectors for depth and value addition (that include automobiles, drug, pharmaceuticals and medical devices, petrochemicals, electronics, chemical, and paper); and finally (d) Sectors for employment generation (that include textiles, food processing, leather and leather goods, and gems and jewellery).

Make in India

Towards addressing the manufacturing challenge of India a new flagship programme – Make in India – has been launched by the present government. Make in India aims at inducing companies – local and foreign – to invest in India to make India a manufacturing powerhouse. The programme focusses on a wide range of industries with considerable potential on account of large domestic market and export competitiveness, which in turn could contribute towards substantial job creation. The industries selected include, but not limited to: automobiles, chemicals, information technology (IT), pharmaceuticals, textiles, ports, aviation, leather, tourism and hospitality, wellness, railways, auto components, design manufacturing, renewable energy, mining, biotechnology, and electronics, among others. The programme, aims at enhancing the ease of doing business *inter alia* by setting up an investor facilitation cell, integrating and providing all the central government services through an e-Biz single window online portal and ensuring all the clearances from the Ministry of Home Affairs within three months.

Strengthening Science, Technology, and Innovation Base

Innovation for Inclusive and Sustainable Development

If the global development experience is any indication, Science, Technology and Innovation (STI) are the major drivers of national development across the world. According to the national innovation system perspective, which has emerged as the most widely used approach in innovation studies published during the last two decades (Fagerberg and Sapprasert, 2011), development of an economy is shaped by its underlying innovation system. It has also been argued that innovation systems approach is eminently suited to understand the bearing of innovation in developing countries (Lundvall, *et al.* 2009). Innovation involves a non-linear process of learning through interaction between different actors and networks leading to competence building at different levels wherein the network of R&D organisations and universities is only one among the many. Central to this process is the co-evolution of innovations and institutions in tune with the changing socio-economic context. More importantly, innovation system is construed not only at the national level, but also at the sectoral/ sub-sectoral, regional/sub-regional and at the level of different technologies. It is also understood that since innovation breeds development, for the development to be inclusive and sustainable, the underlying innovation

system has to be inclusive with focus on sustainable technologies (Joseph, 2014a,b). It is the nature of interaction and the co-evolution of institutions and innovations that guarantee an inclusive and sustainable innovation system.

It may be noted that the major point of departure of the SDGs from the MDGs as is evident from Rio+20 outcome document is its explicit recognition of the role of science, technology and innovation in promoting sustainable, inclusive and equitable economic growth. Towards accomplishing this, the Rio +20 outcome document also emphasised the importance of technology transfer to developing countries and recall the provisions on technology transfer, finance, access to information, and intellectual property rights as agreed in the Johannesburg Plan of Implementation. The document further stressed the importance of cooperative action on technology innovation, research and development for capacity building at all levels. In this context, the role of foreign direct investment, international trade and international cooperation in the transfer of environmentally sound technologies has also been highlighted.

India's Approach in Perspective

India is one of the pioneering developing countries that recognised the key role of science and technology in economic development at an early stage. The science and technology paradigm for India was laid down unambiguously by the Science Policy Resolution (SPR) passed by the Indian Parliament in 1958 which called for pursuing self-reliance in technology and highlighted the need to "foster, promote, and sustain, by all appropriate means, the cultivation of science and scientific research in all its aspects – pure, applied and educational". The agenda was taken forward with the Science Policy Statement (SPS) of 1983 and subsequently by the Science and Technology Policy (STP) of 2003. While the former aimed at achieving technological competence and self-reliance the latter emphasised the need for investment in R&D and integrating programmes of economic and social sectors with national R&D which involves building of a national innovation system.

In sync with the global trend, policymakers in India also have placed science and technology at the centre stage of the agenda of achieving faster, sustainable and inclusive growth. The decade 2010-20 has been designated by the President of the country as 'decade of innovation' and the Prime Minister's Office had come up with an insightful strategy paper 'Towards a more innovative and inclusive India: Creating a Roadmap for a Decade of Innovation' (hereafter the Roadmap). The Roadmap is salutary document setting off a paradigm shift towards harnessing innovation for inclusive development. To begin with, given its concern for inclusive development, innovation has been understood in a broader perspective. The Roadmap departs from the earlier S&T policies when it states: "while we do need to increase R&D investment and efforts, this view of innovation is based on a myopic perception that restricts it to the confines of formal R&D". Hence it makes the case for a "strong innovation ecosystem shaped by the interactions within and across multiple players such as Government, firms, schools/education and research institutions, finance, individual innovators, customers/users, NGOs and media. Given its broader approach towards innovation and considering the diversity of our country, it also calls for the establishment of innovation councils at the national, state, and sectoral levels.

The Roadmap has an explicit inclusive innovation strategy with a need based approach towards creating an 'Indian model of development'. In concrete terms, it suggests a strategy that involves facilitation of innovations that lead to frugal cost products and services that are affordable to people at low levels of income. It also provided for an Inclusive Innovation Fund (Rs. 5000 crore) for designing solutions for people at the bottom of the pyramid.

Science, Technology and Innovation Policy (STIP) 2013

The STIP 2013, makes a point of departure from the earlier S&T policies when it stated "science, technology and innovation for the people" as the new paradigm of the Indian STI enterprise. The Roadmap along with the STIP 2013 presents the broad contours of the new inclusive innovation paradigm and the trajectory therein.

The STIP 2013, while translating the Roadmap into policy action for inclusive development, calls for "new structural mechanisms and models to address the pressing challenges of energy and environment, food

and nutrition, water and sanitation, habitat, affordable healthcare and skill building and unemployment". What is refreshing in the new policy, as compared to its predecessors, is its call for integrating the process of innovation with science and technology and making innovation inclusive as a means to fostering inclusive growth. It induces the national S&T enterprise to embrace S&T led innovation as a driver of development, as innovation is yet to be reckoned as an instrument of policy. Towards ensuring access, availability and affordability of solutions for below the pyramid population it envisages driving investment in science and investment in science-led technology and innovation in select areas of socio-economic importance.

The key elements of the STI policy are:

- Promoting the spread of scientific temper amongst all sections of society.
- Enhancing skill for applications of science among the young from all social strata.
- Making careers in science, research and innovation attractive enough for talented and bright minds.
- Establishing world class infrastructure for R&D for gaining global leadership in some select frontier areas of science.
- Positioning India among the top five global scientific powers by 2020.
- Linking contributions of science, research and innovation system with the inclusive economic growth agenda and combining priorities of excellence and relevance.
- Creating an environment for enhanced Private Sector Participation in R&D.
- Enabling conversion of R&D outputs into societal and commercial applications by replicating hitherto successful models as well as establishing new public-private partnership (PPP) structures.
- Seeding S&T-based high-risk innovations through new mechanisms.
- Fostering resource-optimised, cost-effective innovations across size and technology domains.
- Triggering changes in the mindset and value systems to recognise, respect and reward performances which create wealth from S&T derived knowledge.
- Creating a robust national innovation system.

With respect to innovation, the policy calls for necessary framework for enabling the integration of innovation with science and technology in identified priority areas. It also calls for new structural mechanisms and models to address the pressing challenges of energy and environment, food and nutrition, water and sanitation, habitat, affordable healthcare and skill building and unemployment. The policy acknowledges that innovation for inclusive growth implies ensuring access, availability and affordability of solutions to as large a population as possible.

The policy calls for strengthening science education, setting up of inter-varsity centres, identification of about 10 sectors of high impact potential, participation in global R&D infrastructure and performance linked incentive schemes. The new policy also upholds the need for doubling the Gross Expenditure in Research and Development (GERD) to 2 per cent of GDP, which has been a national goal set for some time. The new policy envisages achieving this goal with greater reliance on private sector R&D *inter alia* through the establishment of large R&D facilities in PPP mode, treating R&D in private sector on par with public institutions for availing public funds, and providing incentives and modifying the IPR system.

The focus of the policy is:

- Facilitating private sector investment in R&D centres in India and overseas.
- Promoting establishment of large R&D facilities in PPP mode with provisions for benefits sharing.
- Permitting multi-stakeholders participation in the Indian R&D system.
- Treating R&D in the private sector at par with public institutions for availing public funds.
- Bench marking of R&D funding mechanisms and patterns globally.
- Modifying IPR policy to provide for marching rights for social goods when supported by public funds and for co-sharing IPRs generated under PPP.
- Launching newer mechanisms for nurturing Technology Business Incubators (TBIs) and science-led entrepreneurship.
- Providing incentives for commercialisation of innovations with focus on green manufacturing.

Harnessing ICT for Inclusive and Sustainable Development

Given the generality of purpose and innovational complementarities, ICT qualifies itself as yet another General Purpose Technology (GPT). On comparing ICT with earlier GPTs, scholars found remarkable parallels in terms of their contribution towards augmenting economic growth and human welfare. In general, it has been argued that ICTs are key inputs for competitiveness, economic growth and development. It offers opportunity for global integration, increasing economic and social well-being of the poor and enhances the effectiveness, efficiency and transparency of the public sector, including the delivery of public services. Thus viewed, there is hardly any field of human activity wherein ICT could not have its profound influence *inter alia* by revolutionising the process of information exchange and thereby reducing the transaction cost. In a sense, the potential of the new technology to contribute towards sustainable and inclusive development in the developing world and foster South-South Cooperation emanate from the fact that while the Western world held monopoly over the earlier GPTs, in case of ICT, the capabilities are more diffused and the Asian countries including India possess significant capabilities.

It is in this context, the SDGs highlight the need for increasing access to ICT and strive to provide universal and affordable access to internet. An implicit argument in such an approach appears to be that the needed technology, both hardware and software, is available in the international technology shelf at a falling price and what the developing countries need to do is only to remove trade restrictions as has been made out under Information Technology Agreement (ITA). Hence, as far as the developing countries are concerned, there is no need to reinvent the wheel but choose appropriately from the international technology shelf. With respect to technology and innovation, such thinking prevailed in the 1960s wherein there has been a proliferation of studies on the choice of technique implying that the core issue before the developing world is just one of choice and not development. The 1980s, however, has seen the emergence of a number of courtiers in the developing world building up substantial technological capability (Fransman and King, 1984). Various studies that analysed the process of technological capability building in the developing world (Lall 1987, 1992) revealed that this would not have been possible had these countries remained passive adopters of Western technology. Hence, if the available empirical evidence on technological capability in the developing world is any indication, the present lopsided approach of promoting ICT use with the neglect of ICT production capabilities has the potential danger of perpetuating technological dependence on the one hand and forgoing opportunities for income and employment generation on the other. (Mytelka and Ohiorhenuan, 2000; Joseph, 2005). Here it is worth remembering that green revolution, which has been an indisputable success story so far as agricultural productivity and economic growth in the developing world are concerned, would not have been possible had the strategy been simply one of passive adoption of Western technologies. The relevant point is that to enable a general purpose technology like ICT to act as an instrument of inclusive and sustainable development there is the need for evolving capabilities both in production and use. Any lopsided approach with focus on either production or use is likely to create sources of exclusion and generate unsustainable outcomes.

India's success story in ICT which attracted the world attention mainly on account of the remarkable performance in the export of software service sector may be inspirational for other developing countries. The recorded growth in the software and service exports from India as well as the credibility that India earned has no parallels in India's economic history. In a context wherein India has been severely constrained by the availability of foreign exchange, share of software exports in total exports that almost doubled from 7.8 per cent in 2000-01 to 14.8 per cent in 2009-10, contributed significantly towards improving the external health of the economy. It is also evident that in the service sector driven growth of the Indian economy software sector played a significant role as its share in service sector GDP almost increased threefold since 2000. Indeed this has not been the handiwork of the market but has been an outcome of the innovation system built up over the years mostly at the instance of state and also other stakeholders like industry associations including the innovative efforts by the individual firms.[1] While, India's performance in the sphere of ICT software

production has been remarkable, its performance in the sphere of ICT hardware and ICT use has been less remarkable. This is not to ignore number of projects at the instance of the state and private actors to harness ICT for development and governance.

Digital India

The journey of e-Governance initiatives in India took a broader dimension in mid-1990s for wider sectoral applications with emphasis on citizen-centric services by harnessing ICT. This got manifested in major ICT initiatives of the Government that included, but not limited to, railway computerisation, land record computerisation and others. The National e-Governance Plan was initiated in 2006 with 31 Mission Mode Projects covering a wide range of domains, viz. agriculture, land records, health, education, passports, police, courts, municipalities, commercial taxes, treasuries and others. Along with this national initiative, different states also started ambitious e-governance projects aiming at providing electronic services to citizens.

Despite the successful implementation of many e-Governance projects across the country, e-Governance as a whole has not been able to make the desired impact and fulfil all its objectives. It has been felt that a lot more thrust is required to ensure e-Governance in the country to promote inclusive growth that covers electronic services, products, devices and job opportunities. In order to transform the entire ecosystem of public services through the use of information technology, the Government of India launched the Digital India programme with the vision to transform India into a digitally empowered society and knowledge economy. India is one of the fastest growing markets for electronics. The demand is projected to reach US$ 400 billion by 2020. Government of India (GoI) has launched the National Policy on Electronics 2012 with the vision to make India a globally competitive destination for Electronics System Design and Manufacturing (ESDM).

While digital India appears to have the potential opportunity to address many of the issues, the programme, as it is conceived, has many shortcomings and bound to result in suboptimal outcomes and frustrations. We need to recognise that being a general purpose technology, ICT potential is not just confined to governance. To the extent that there is hardly any sectors of the economy and segments of the society where ICT can not have its profound influence, the digital India should be based on the twin foundations of achieving balanced development of software and hardware sector along with a balanced approach towards ICT production and use. While the former issue has attracted the attention of Digital India Programme, the latter issue is yet to receive the attention that it deserves.

Building Resilient Infrastructure

While there is a general consensus on the role of infrastructure in development, it is generally believed that the developing countries are confronted with severe infrastructure gaps in their efforts to alleviate growth constraints, respond to urbanisation pressures and meet their crucial goals for inclusive growth (Bhattacharya *et al.*, 2012). Addressing the infrastructure deficit appears to be a major challenge for the developing counties, including India, on account of the financial and technological needs. The intensity of the challenge becomes more severe since the past paradigms towards infrastructure development on account of their adverse impact on environment are inimical to sustainable development and, therefore, of limited relevance for the developing counties. It is in this context that 3i Network (2010) outlined the broad contours of infrastructure in a low carbon economy.

In India as the economic growth picked up there has been increasing stress on physical infrastructure such as electricity, railways, roads, ports, airports, irrigation, and urban and rural water supply and sanitation, and IT infrastructure to cater to the emerging new economy. Hence the issues raised above are of much relevance to India as well. Though much progress has been made in this direction (see Rastogi, 2008; 3i Network 2008 for a review of policies and progress) much more needs to be done. Realising this reality the state has undertaken various proactive measures towards building a vibrant infrastructure (see Box 1).

While dealing with infrastructure for development, there arise a number of issues like those relating to financing of investment in infrastructure, ensuring quality and access, governance structure and others in addition to the most important challenge of building sustainability oriented infrastructure network.

Box 1: Recent Government Initiatives towards Building Infrastructure in India

- Prime Minister of India indicated that the government has rolled out stuck projects worth Rs. 4 lakh crore (US$ 60 billion) in the past six months (ending November 2015), while stating that infrastructure development is the government's top priority in order to improve economic growth.
- The Union Cabinet has approved several reforms such as allowing National Highways Authority of India (NHAI) to extend the concession period for current incomplete projects in build-operate-transfer (BOT) mode.
- The Government of India has earmarked Rs. 50,000 crore (US$ 7.5 billion) to develop 100 smart cities across the country. The Government released its list of 98 cities for the smart cities project in August 2015.
- Government of India plans to launch the National Infrastructure Investment Fund (NIFF) with an initial corpus of at least Rs. 40,000 crore (US$ 6 billion).
- The Government of India has unveiled plans to invest US$ 137 billion in its rail network over the next five years, heralding an aggressive approach to building infrastructure needed to unlock faster economic growth.
- The Government of India has announced highway projects worth US$ 93 billion, which include government flagship National Highways Building Project (NHDP) with total investment of US$ 45 billion over next three years.
- The Ministry of Urban Development has approved an investment of Rs. 19,170 crore (US$ 2.88 billion) for improving basic urban infrastructure in 474 cities in 18 states and Union Territories (UTs) under Atal Mission for Urban Rejuvenation and Transformation (AMRUT) for 2015-16.
- The Department of Industrial Policy and Promotion (DIPP) has set up an online monitoring system for on-going projects under the Industrial Infrastructure Upgradation Scheme (IIUS).
- The Ministry of Urban Development has decided to allow the use of construction and demolition waste up to 20 per cent in construction of load bearing items and up to 100 per cent for non-load bearing purposes. This provision is expected to significantly help in reuse of such waste, in line with ongoing efforts under Swachh Bharat Mission (SBM).
- The Central Government has approved amendments to 'The National Waterways Bill, 2015' which will provide for enacting a central legislation to declare 106 additional inland waterways, as the national waterways.
- The Government of India plans to award 100 highway projects under the PPP mode in 2016, with expectations that recent amendments in regulations would revive investor sentiments in PPP projects in the infrastructure sector.
- In the Budget 2015-16, the capital outlays for roads, and railways have been increased by Rs. 140.3 billion (US$ 2.11 billion) and Rs. 100.5 billion (US$ 1.51 billion), respectively.

Source: India Brand Equity Foundation; www.ibef.org

With respect to financing infrastructure the public sector plays an important role. But, given the emergence and presence of private sector capabilities, the relevance of public private participation has increasingly been recognised (3i Network, 2008). With a view to ensure that infrastructure should not be a constraint for growth, 11th plan envisaged that at least 75 per cent of new investment into infrastructure will come from private sector – some in the form of fully private ventures and others as public private partnerships (Planning Commission, 2006). It has also been stressed that the approach to PPPs must remain

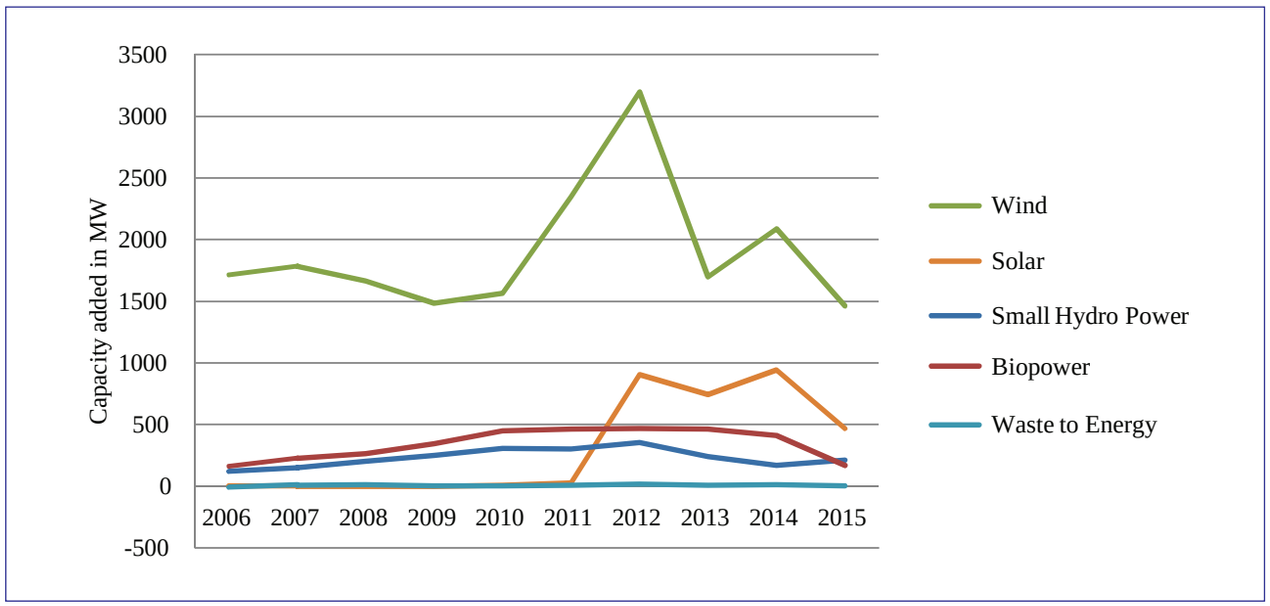
Box 2: Recent FDI and PPP in Infrastructure Sector in India

- The Reserve Bank of India (RBI) has notified 100 per cent foreign direct investment (FDI) under automatic route in the construction development sector. The new limit came into effect in December 2014.
- The Government of India has relaxed rules for FDI in the construction sector by reducing minimum built-up area as well as capital requirement. It has also liberalised the exit norms. In fact, the Cabinet has also approved the proposal to amend the FDI policy.
- India and the US have signed a memorandum of understanding (MoU) in order to establish Infrastructure Collaboration Platform. The document showcases the relationship between both the Governments which intend to facilitate US industry participation in Indian infrastructure projects to improve the bilateral relationship and benefit both economies. The MoU's scope envisages efforts in the areas of Urban Development, Commerce and Industry, Railways, Road Transport and Highways, Micro, Small and Medium Enterprises, Power, New and Renewable Energy, among others.
- BNP Paribas Lease Group, subsidiary of BNP Paribas Group, has acquired 5 per cent stake in SREI Infrastructure Finance, by selling its entire 50 per cent stake in SREI Equipment Finance Limited (SEFL) to SREI Infrastructure Finance, thus allowing them to play a larger role in the infrastructure finance business.
- Private equity giant Carlyle Group is planning to invest Rs. 500 crore (US$ 75 million) in Feedback Infra, which could make the US firm a major shareholder in the Gurgaon-based infrastructure services company.
- In the month of November 2015, among various areas of infrastructure spending by the government, the roads segment led in terms of tenders issued (59 per cent of total tenders) and contracts awarded, with an increasing shift to Engineering, Procurement and Construction (EPC) type of contracts.
- PTC India Financial Services (PFS) and India Infrastructure Finance Company Limited (IIFCL) have signed a Memorandum of Understanding (MoU) to jointly provide funding for infrastructure projects in India, particularly in the energy sector.
- France has announced a commitment of € 2 billion (US$ 2.17 billion) to convert Chandigarh, Nagpur and Puducherry into smart cities.
- The Construction Industry Development Board (CIDB) of Malaysia has proposed to invest US$ 30 billion in urban development and housing projects in India, such as a mini-smart city adjacent to New Delhi Railway Station, a green city project at Garhmukhteshwar in Uttar Pradesh and the Ganga cleaning projects.
- International Finance Corporation (IFC), part of The World Bank group, plans to invest at least US$ 700 million in existing transport and logistics infrastructure projects in India.
- The World Bank has approved a US$ 650 million debt funding for a part of the eastern arm of the Dedicated Freight Corridor (DFC) project in India.
- Indostar Capital Finance Limited and Reliance Capital Limited have invested Rs. 200 crore (US$ 30 million) in Alliance group, a real estate company. The consortium of institutions has invested in the holding company of Alliance group, Alliance Infrastructure Projects Private Limited.

Source: India Brand Equity Foundation; www.ibef.org

firmly grounded in principles, which ensure that PPPs are formulated and executed in public interest with a view to achieving additional capacity and delivery of public services at reasonable cost. These partnerships must ensure the supplementing of scarce public resources for investment in infrastructure sectors, while improving efficiencies and reducing costs. As noted in the Approach to the Eleventh Plan of India, PPPs must aim at bringing private resources into public projects, not public resources into private projects. Of

Figure 1: Yearly Addition to Installed Capacity in Different Renewable Energy



Source: Sreelakshsmi (2016).

late there has been a number of major FDI projects as well as projects in the PPP mode towards addressing the infrastructure deficit in the country (see Box 2).

While the deficits in power infrastructure continue to act as a drag on the growth of the economy, in general, and industrial sector, in particular, a major challenge for the developing countries is towards evolving a new paradigm for infrastructure development that is oriented towards sustainability. Given the adverse environmental effect of conventional energy sources, the role of innovations for harnessing new and renewable sources of energy for addressing energy poverty and sustainability issues in power sector cannot be over emphasised.

Because of the concerted efforts at the instance of the Ministry of New and Renewable Energy (MNRE) and its associated agencies in research, design, development and deployment of Renewable Energy Technologies (RETs), the share of renewable energy in India's total power generation capacity has risen to 13.1 per cent. However, it still comprises just 2 per cent of the energy demand, and most of the existing potential remains to be harnessed (MNRE, 2014). However, it has been observed that despite much potential for renewable energy sources, there has been a deceleration in the capacity addition in recent years (see Figure 1).

Similarly, there has been a pronounced variation across different states with respect to more promising renewable sources of energy like wind and solar. Gujarat, the state with the highest wind energy potential, ranks only fourth when it comes to installed capacity, and has utilised only 10 per cent of its potential. Maharashtra and Rajasthan with relatively lower potentials have higher installed capacities as well as much higher shares of potential harvested than Gujarat. Disparities exist even among states with closer levels of estimated potential such as Andhra Pradesh, Karnataka and Tamil Nadu.

Similar to the wind energy the production of solar energy is also concentrated in a few states, namely: Andhra Pradesh, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu. Together, these states possess 56 per cent of the total solar energy potential in the country. Disparities in deployment exist among these states in the case of solar energy as well. Gujarat is doing exceptionally well, with almost 3 per cent of its potential harnessed, compared to around 0.5 per cent to 0.6 per cent in the other states.

Concluding Remarks: South-South Cooperation

Paradoxically, during 1970s and 1980s when the developing countries had only their poverty to share, South-South cooperation has been much debated among the developing countries.[2] The issue seems to have taken a back seat during the last decade as the developing countries were increasingly experimenting with trade and investment liberalisation under Globalisation. But today, with increasing disenchantment among developing countries with globalisation and creation of substantial technological capabilities in the South which in turn has contributed to southern development solutions, the South-South Cooperation is gaining momentum (Joseph 2006; Chaturvedi *et al.*, 2012).

As already stated, given IT capabilities in the South, the potential for South-South cooperation in ICT is immense. While Japan and South East Asian countries (Ernst, 2001) used to hold leading position in the manufacture of ICT goods, China of late has joined the league. In the field of ICT software and services India has emerged as a major player in the world market. Though there have been apprehensions about Indian software firms focusing on low end of the software value chain, some evidence suggest that India's software sector has been moving up the value chain. Further there are a number of ICT innovations from India addressing issues specific to developing country like affordability, illiteracy and last mile connectivity. Therefore, unlike the developing countries of 1950s and 1960s that had to resort to the difficult task of importing and adapting technologies from the North, for today's developing countries that are lagging behind in the sphere of ICT, there are many a "ready to use" innovations from the ICT technology shelves of emerging countries in the South. Hence these countries have the less risky and less costly option of transferring technologies from other countries in the south to hasten their catching up process.

While China is known for its hardware production capabilities, evidence also suggest that China is also emerging as a major producer of software and much of it has been used domestically which in turn could have been instrumental in increasing the efficiency and competitiveness of other sectors of the economy (Joseph, 2013). India and China are not isolated success stories in the South. A number of non-G7 countries have developed capabilities in the field IT and software (Arora and Gambardella, 2004; Ojo *et al.*, 2008) and a new generation of countries like Philippines, Morocco, Costa Rica and others have joined the bandwagon (UNCTAD, 2003). Thus ways and means by which these countries have managed building up IT capabilities and ways in which it has been harnessed for addressing various development issues might offer very valid lessons for other developing countries.

Thus the need for South-South cooperation is obvious because of the existence of IT capabilities in the South and marked divergence in the IT interests of developing and developed countries. Going by the available evidence, cooperation in the sphere of ICT has emerged as a major agenda in many of the regional cooperation agreements starting with the e-ASEAN framework agreement. India is very actively contributing in South-South Cooperation in ICTs (Joseph, 2005; Joseph and Parayil, 2009).

Endnotes

1 See for details Joseph (2006), Kumar and Joseph (2006) Balakrishnan (2006) also Sen (2007).

2 See in this context among others, RIS (1987) and South Commission (1990).

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Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation: Targets and Indicators	
9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all	9.1.1 Proportion of the rural population who live within 2 km of an all-season road 9.1.2 Passenger and freight volumes, by mode of transport
9.2 Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries	9.2.1 Manufacturing value added as a proportion of GDP and per capita 9.2.2 Manufacturing employment as a proportion of total employment
9.3 Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets	9.3.1 Proportion of small-scale industries in total industry value added 9.3.2 Proportion of small-scale industries with a loan or line of credit
9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities	9.4.1 CO2 emission per unit of value added
9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending	9.5.1 Research and development expenditure as a proportion of GDP 9.5.2 Researchers (in full-time equivalent) per million inhabitants
9.a Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States	9.a.1 Total official international support (official development assistance plus other official flows) to infrastructure
9.b Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities	9.b.1 Proportion of medium and high-tech industry value added in total value added
9.c Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020	9.c.1 Proportion of population covered by a mobile network, by technology

10
Trade, Infrastructure and Inequality: A Cross Country Analysis

Introduction

In spite of the success of Millennium Development Goals (MDGs), many principals including equality, outlined in Millennium Declaration have not been integrated. As MDGs mainly focussed on national and global averages, they failed to check the growing disparities at the regional level and also among specific groups of population. The Post-2015 Development Agenda takes into consideration the Rio+20 promises to "strive for a world that is just, equitable and inclusive". The Sustainable Development Goals (SDGs) ensure the inclusion of marginalised, disempowered and excluded groups, and reducing within and between inequalities along with poverty eradication. The SDGs have specific targets for reduction of inequality and this paper is an endeavour to suggest how those targets can be met through various policy initiatives. There are two good reasons to study issues related to income and wealth distribution. Firstly, there are philosophical and ethical grounds for reduction of inequality. Second and most importantly, even if the problem of inequality at an intrinsic level is ignored, care must be taken at the functional level; that is its impact on other economic features. Widening inequality is believed to have significant implications for economic growth and macroeconomic stability as it can lead to concentration of political and decision making power in the hands of a few, leading to a suboptimal use of resources that may raise the chances of political and economic instability.

In the recent past the relationship between globalisation and inequality has attracted considerable attention. Trade liberalisation is an integral part of globalisation and thus there is good reason to study the effects of trade liberalisation on inequality. Globalisation and hence trade liberalisation has both short run and long run effects on inequality and poverty reduction. In the short run, trade liberalisation changes returns to labour and other factors and thus reduce inequality; in long run, through growth of output trade liberalisation indirectly impact on wages and inequality (Acharyya, 2008).

Infrastructure

In the modern era, when trade liberalisation compels countries to face more global competition, infrastructure development helps them to become more competitive. At the same time, there is empirical evidence showing a negative impact of quantity and quality of infrastructure on inequality. A number of studies show that some specific categories of public spending such as public investments in infrastructure, on health and education, and social insurance provision, may be pro-growth and pro-equality (see Benabou, 2000, 2002; and Bleaney *et al.*, 2001). Infrastructure development can have a positive impact on the income and welfare of the poor over its impact on average income[1] (Lopez, 2003). Infrastructure development allows poor to access additional productive opportunities and thus helps poorer individuals and underdeveloped areas to get connected to core economic activities (Estache, 2003). Reduction of production and transaction costs is possible if infrastructure development takes place in poorer regions (Gannon and Liu, 1997). Thus development of infrastructure is necessary to reduce income inequality, when it results in improved access and/or enhanced quality especially for low-income households (Estache *et al.*, 2000). Along with quantity, quality of infrastructure also plays an important role in reducing inequality. Chong and Calderon (2001) find that development of infrastructure, quantitatively and qualitatively, is associated with reduction of inequality. Working on ASEAN countries, Seneviratne and Sun

(2013) show that better infrastructure both in quantity and quality improve income distribution. In the Indian context there are few studies related to inequality and infrastructure. Bajar and Rajeev (2015), working with 17 major Indian states and different infrastructural indicators, find a positive relationship between infrastructure and inequality and thus contradict the existing literature. Another important factor for reduction of inequality is financial infrastructure. Some studies find a positive impact of development of financial markets on income distribution as more developed and free markets widen the availability of credit especially to the poorer section of the society and thus allow them to invest in building their human and physical capital (Banerjee and Newman, 1993). The relationship between the two is complex in the sense that while Galor and Zeira (1993) and Banerjee and Newman (1993) find a linear relationship between financial development and income inequality, Greenwood and Jovanovic (1990) find an inverted U-shaped relationship.

Trade Openness

Trade openness is an important factor influencing income inequality. According to the Heckscher-Ohlin theory, if a country open ups to trade, redistribution takes place in favour of abundant factors and as the poorer section of the society mostly owns these factors they certainly gain from it. Anderson (2005) identifying some channels through which increased trade openness could affect income inequality, suggests that countries engaged in trade may be more eager to use re-distributional policies since some groups are likely to suffer an income loss when the economy is subject to trade. Some studies find that trade openness significantly reduces income inequality (White and Anderson, 2001; Dollar and Kray, 2002; Edwards, 1997b; and Higgins and Williamson, 1999). This result is not universal in the sense that using a trade-GDP ratio Barro (2000) and using an S&W index, Lundberg and Squire (2003) find that increase in trade openness increases inequality. Spilimbergo *et al.* (1999) suggest the opposite, that countries engaged in trade are likely to have liberal governments who are also likely not to redistribute income in their country. Thus, if the benefits of trade are not naturally distributed evenly, these countries would experience increased inequality as a result of trade. In the same vein one may discuss the importance of trade liberalisation. In a more liberalised trade regime, income inequality is expected to be reduced.

Foreign Direct Investment (FDI)

The relationship between FDI, growth and inequality has also been investigated thoroughly in literature. While a number of studies find a significant role of FDI to reduce inequality and poverty in the host country by improving technology and productivity, critics put forth counter arguments. Some studies find evidence from emerging market economies that FDI increases inequality in host countries by benefitting skilled workers more than unskilled workers (see Aitken *et al.* 1996; Feenstra and Hanson, 1997; Lipsey and Sjoholm, 2004; Mah, 2002, and Hanson, 2003). Inward FDI deteriorates income distribution by raising wages in the corresponding sectors in comparison with traditional sectors (Girling, 1973; Rubinson, 1976; Bornschier and Chase-Dunn, 1985; Tsai, 1995). However, the opposite conclusion is also drawn by a number of studies (see Markusen and Venables, 1997; Blonigen and Slaughter, 2001; Aghion and Howitt, 1998, etc.). FDI is argued to help reduce income inequality by utilising abundant low-income unskilled labour (Deardorff and Stern, 1994) or when capital, domestic or foreign, stimulates economic growth and its benefits eventually spread throughout the whole economy (Tsai, 1995).

This paper is divided in six major sections. This short introduction is followed by a discussion on relevance of inequality in SDGs. Section 3 presents a snapshot view of inequality across countries. Data and methodology are discussed in section 4. Section 5 presents the results and lastly we conclude by discussing possible policy interventions.

Inequality and Sustainable Development Goals

Fifteen years back, global leaders took a historic decision to eradicate poverty, hunger, killer diseases, unmet schooling, gender inequality, and reduce environmental degradation. By packaging these priorities into an easily understandable set of eight goals, and by establishing measurable and time-bound objectives, MDGs are believed to help to promote

global awareness, political accountability, improved metrics, social feedback, and public pressure. Although the degree of progress varies extensively across goals, countries and regions, developing countries have made significant progress towards achievement of the MDGs. Substantial progress was seen with regards to poverty, hunger and diseases. However, the objective of social inclusion or reduction of inequality was lost somewhere. In 2010, at the time of the UN MDG summit, the Institute of Development Studies (IDS) and the MDG Achievement Fund released a report claiming that the MDG targets largely overlooked inequality. It has been shown that in countries where development has taken place in terms of MDG targets, inequality has increased substantially. On the other hand, some emerging concerns such as climate change and other environmental ills alongside the inequality reduction objectives have compelled global leaders to proceed to a more punctilious agenda of "sustainable development" to help the world to move to a sustainable trajectory. A high level global sustainability panel, appointed in the run up to the Rio+20 Summit in 20-22 June 2012, had submitted its report recommending a set of SDGs.

The 10th goal among the 17 goals that make up the 2030 Agenda for Sustainable Development is to "reduce inequality within and among countries". Compared to MDGs, targets to reduce inequality in SDGs seems more comprehensive as the reference to both "within" and "among" countries stresses the importance of inequality reduction in all countries. Under SDG10, the structural factors, such as lack of fiscal, wage and social policies, discrimination, lack of representation, etc., that cause inequality are identified and are focussed on. Therefore, targets set under SDG10 have a broad scope.

Let us now very briefly discuss importance of each target. The first target, Target 10.1 is precisely a measurable target that stipulates that by 2030, an above-average growth of income of the bottom 40 per cent of population needs to be achieved. This target is to reduce the within country inequality at the absolute level or to reduce inequality among different income groups. The second target, Target 10.2 aims social, political and economic inclusion of population without any discrimination on the basis of age, sex, disability, race, religion, etc. With firm contrast to MDGs, this target ensures a fair distribution of progress towards all targets of 2030 Agenda and goes hand in hand with the suggestion of the UN Secretary General's synthesis report (2014), to consider a target to be achieved if and only if it is met for all relevant income and social groups. Target 10.3 requires reducing inequality of outcome caused by discriminating laws, policies and practices and calls for sound policy action in this regard. This problem is very likely to occur and is sensitive. Thus choosing proper indicator to measure this type of discrimination is important and in this regard a relevant module is to be developed and should be integrated with national sample surveys, etc. Target 10.4 calls for adoption of appropriate fiscal, wage and social protection policies for a progress towards greater equality. This target lacks clarity as it does not indicate any direction for change. There are several indicators related to this target, such as labour share of GDP, comprising wages and social protection transfers and progressivity of tax and social expenditures. However, collection of data to estimate these indicators is not very easy. Target 10.5 can be said to be linked with Goal 17 as it requires improvement of financial regulation and strengthening of the same by monitoring global financial markets and institutions. Target 10.6 is to reduce inequality among countries and is probably the most important target. An indicator to measure the representation of developing countries in global fora, used by Inter-agency and Expert Group on Sustainable Development Goals Indicators (IAEG-SDGs), is the percentage of members or voting rights of developing countries in international organisations. The last target is about "orderly, safe, regular and responsible migration". Inter- and intra-country migration is responsible for both within country and among country inequality. Thus targeting migration is urgently required.

Now given the targets the most important question is what are the means of implementation? The SDGs merely consist of some targets without any proper direction or policy prescription to achieve those targets. Firstly, the targets require differential and special treatments for developing and especially least developing countries in accordance with World Trade Organisation (WTO) agreements. Secondly, encouragement of Official Development Assistance (ODA) especially FDI to developing and least

developed countries in accordance with their national plans is also required. Third and most importantly, reduction of transaction cost is important. Otherwise implementation of other macroeconomic and social policies will be difficult and far from the targeted level with these targets in the backdrop, this study underlying income inequality between and within inequalities.

A Snapshot View of Inequality across Countries

Cross country comparisons of inequality are generally plagued by problems of poor reliability, lack of coverage, and inconsistent data and methodology. The World Bank database has been used for this study. Three indicators, namely the difference between income shares of top 20 per cent and bottom 20 per cent of the population, the difference between income shares of top 10 per cent and bottom 10 per cent of the population, and the Gini index are considered. With over 0.99 correlations between every pair of the above three indicators, they can be used interchangeably. From the yearly data of different indicators related to inequality, average inequality indicators are calculated for the last decade of the 20th century (1991-2000) and the first decade of the 21st century (2001-2010), given in Table 1 in Appendix 1. Comparing average inequality in all continents, highest level of inequality is found in African countries, followed by South American and North American Countries. Inequality is lowest in European countries. The discussion on inequality across countries requires some more detail, which is as follows.

Africa: Comparison of inequality in the African continent between 1990s and 2000s is shown in the first part of Table 1 in Appendix 1. Very high inequality is seen in countries like Botswana, Central African Republic, Namibia and South Africa. In Botswana, Kenya, Ethiopia, Nigeria and Cameron, all three indicators show a downward trend from the 1990s to the 2000s, whereas in countries like Egypt, Morocco, and South Africa they tend to increase. As an Emerging Market Economy, South Africa show high economic growth in 2000s, it also experienced a large increase in inequality, as the Gini coefficient is found to increase from 57.96 to 63.33.

Asia and Australia: Inequality in Asian countries is not as severe as in African countries. From 1990s to 2000s when the Chinese economy showed an increase in inequality, India and Indonesia experienced a moderate increase. Small countries like Jordon, Kazakhstan, Malaysia, Pakistan, Philippines and large countries like Russia, Thailand showed a decline in inequality, whereas Bangladesh and Sri Lanka experienced an increase in inequality. Inequality measured in terms of Gini coefficient for Bangladesh increased from 30.5 to 32.9. China showed almost 15 per cent increase in inequality in last two decades. In case of India, the Gini coefficient increased from 30.8 to 33.6. Among ASEAN countries, in Indonesia, Lao PDR and Vietnam Gini coefficient increased from 29.37 to 34.3, from 32.7 to 34.7 and from 35.6 to 36.8 respectively. Some other ASEAN countries like Philippines and Thailand showed downward trend in inequality. In Australia inequality increased slightly.[2] In 1990s average inequality measured in terms of Gini coefficient was 33.7which increased to 34.1 in 2000s.

Europe: The third part of Table 1 shows inequality estimates for Europe. In general, inequality across countries in Europe is lower than those in Asian and African countries. In the 21st century, European countries show a mixed trend in terms of decline in inequality. Inequality, measured in terms of Gini coefficient declined in Austria, France, Greece, Ireland, Moldova, Netherlands, Spain and Ukraine and increased in all other countries. At the same time Switzerland successfully reduced its level of inequality from a level of 37.10 to 32.70 (and in counties like Belgium it went up from a level of 26.75 to 33.14.

North America: Inequality in North American countries is higher than those in Asian and European countries but lower than in African countries. Inequality increased in the 21st century in almost all major countries in this continent, though the magnitude varies across countries. In the United States, inequality measured in terms of all three indicators increased marginally. Some countries such as Guatemala, Mexico, Nicaragua and Panama, however, showed a marginal decline in inequality.

South America: In all countries in this continent, inequality is very severe. High level of income and consumption inequality persists in countries like Bolivia, Brazil, Chile, Colombia, Paraguay, etc. From the last decade of 20th century to the beginning of 21st century, inequality increased in all countries except

Brazil, Chile and Ecuador. In Paraguay and Peru it increased marginally.

Inequality in India

Even as the Indian economy has been registering steady growth in the recent years, poverty and inequality remain a major concern to policy makers. Sustained growth is a necessary condition for poverty reduction but not sufficient (Ali and Son, 2007), as inequality plays an important role here. While Indian policy makers have been giving considerable attention to reduction of poverty, they remained unconcerned about inequality despite the fact that increase in inequality not only slows down the growth process but also hinders the process of poverty reduction. If we ignore the financial crisis period, the Indian economy has been growing at a rate between 6 to 9 per cent per annum in real terms for the last two decades. This was possible mainly because the Indian economy integrated more closely with the global economy after reforms of 1990s and due to the exposure to external competition as well as the incentives generated by global relative prices. It was expected to bring about labour-intensive industrialisation and a Lewis-style transformation of economy along with reduction in inequality. However, since independence inequality in India did not show any nosedive (Chandrasekhar and Ghosh, 2015). Based on several estimates of inequality considering income or consumption distribution, many studies have explained the upward trend of inequality in India. Most of the studies have used National Sample Survey (NSS) consumption expenditure survey statistics to calculate Gini coefficients. A few studies have mentioned several problems associated with the 55th round, 1999-2000 data of NSS statistics (see Sen, 2001; Deaton and Dreze, 2002; Sen and Himanshu, 2005, etc.) and some others have revised their estimates accordingly (see Deaton and Dreeze, 2002; Sundaram and Tendulkar, 2003a and 2003b; Sen and Himanshu, 2005). In general these studies show that between 1993-94 (50th round) and 1999-2000 (55th round) rural inequality had increased significantly. Using real mean per capita expenditure data Sen and Himanshu (2005) provide the striking evidence of increased inequality in the post-liberalisation period. Using *India Human Development Survey* (*IHDS*) data, Vanneman and Dubey (2011) show the upsurge of both vertical and horizontal inequality of consumption in India. Based on the consumption data, Chandrasekhar and Ghosh (2015) show that from 1993-94 to 2009-10, national Gini coefficient of consumption has increased from 0.31 to 0.36.

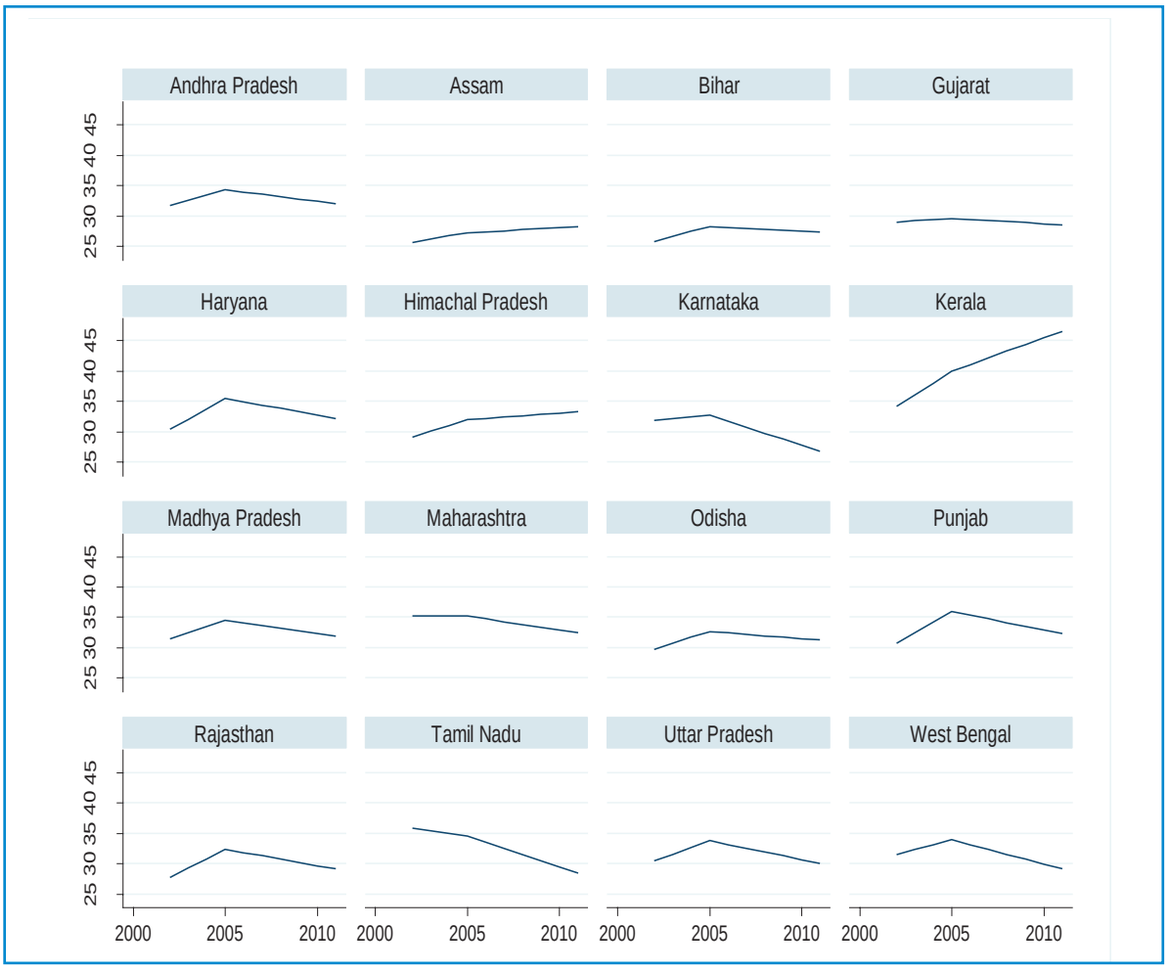
India is a widely diverse country of over a billion people, and hence, it is necessary to discuss the overall trend of inequality at a disaggregated level. If Gini index calculated on the basis of monthly per capita consumption expenditure at the state level, is considered no overall trend of inequality is found (see Table 1a in Appendix 1). During, 1974 to 1978 inequality increased in all states except for West Bengal. However, from 1978 to 1984 inequality increased in states such as Andhra Pradesh (AP), Haryana, Himachal Pradesh (HP), Karnataka, Tamil Nadu, and West Bengal when in all other states the Gini coefficient declined. In the pre- and post-liberalisation period, inequality showed an interesting pattern. While inequality increased in Assam, Kerala, Madhya Pradesh (MP), Orissa, and Uttar Pradesh (UP) between 1984 to 1988, inequality declined in AP, Assam, Gujarat, Karnataka, Kerala, Orrisa, Punjab and Rajasthan between 1988 to 1994. It is interesting to find that in the beginning of 21st century, inequality decreased in almost all states except Gujarat, Karnataka and Tamil Nadu. In between 2000 and 2005 when the Indian economy experienced massive growth, inequality increased in all states except for Maharastra where inequality declined marginally. In the aftermath of the Global Financial Crisis, inequality declined noticeably in all states except for Assam, HP and Kerala. It is striking that in Kerala between 2005 and 2010, Gini index increased by over 13 per cent. Therefore in summary, in 1970s and 1980s the Indian economy experienced moderate growth, while inequality increased in mainly large states which contributed significantly in country's economic growth. When liberalisation failed to reduce inequality universally in the subsequent period, high growth phase of the early 21st century led to the increase in inequality in these states.

Empirical Analysis

Empirical Model and Data

This empirical analysis uses three models for estimation. In the first model, i.e. the baseline model, the non-linear relationship between inequality and

Figure 1: Trends in Inequality across States in India



Source: Planning Commission of India database.

GDP growth (commonly known as the Kuznets (1955, 1963) inverted U hypothesis) is checked by regressing inequality on per-capita GDP and its square. The estimated model is as follows:

$$(\ln INQ)_{it} = \beta_0 + \beta_1(\ln PCGDP)_{it} + \beta_1(\ln PCGDP)^2_{it} + \varepsilon_{it} \quad (1)$$

where, ln INQ = log of inequality index

ln PCGDP = log of per capita GDP

While estimating the second model, different macroeconomic factors related to globalisation or more specifically trade liberalisation are considered. This model helps to understand the importance of free trade and sound macroeconomic policies in reducing income inequality.

$$(\ln INQ)_{it} = \beta_0 + \beta_1(\ln PCGDP)_{it} + \beta_2(\ln PCGDP)^2_{it} + \beta_3(\ln inf)_{it} + \beta_4(\ln TO)_{it} + \beta_5(\ln Tariff)_{it} + \beta_6(\ln FDI)_{it} + \varepsilon_{it} \quad (2)$$

where ln inf = log of inflation

ln TO = log of trade openness

ln Tariff = log of average tariff rate

ln FDI = log of FDI

The third model considers different types of infrastructures: physical and financial and human capital, and related variables including urbanisation and distribution of arable land that might affect income inequality. The model is as follows:

$$(\ln INQ)_{it} = \beta_0 + \beta_1(\ln PCGDP)_{it} + \beta_2(\ln ISI)_{it} + \beta_3(\ln HCI)_{it} + \beta_4(\ln Fi)_{it} + \beta_5(UI)_{it} \beta_6(\ln PC\ Land)_{it} + \beta_7(\ln InfraQ)_{it} + \varepsilon_{it} \quad (3)$$

where ln ISI = log of infrastructure stock index

ln HCI = log of human capital index

ln FI = log of financial infrastructure

UI = urbanisation index

ln PC Land= log of percapita arable land holding

ln InfraQ =log of infrastructure quality

Data sources used in this analysis are collected from World Development Indicators[3]. An unbalanced panel, depending on income inequality data, of all developing, emerging and advanced countries is considered for the period 1991-2014.

Econometric Methodology

Each model described above are estimated using pooled data Ordinary Least Square (OLS), fixed and random effects panel data model. The Bruesh-Pagan Lagrange Multiplier test is done to choose between simple OLS and random effect panel data model. On the other hand, Hausman test is undertaken to choose between fixed and random effect panel data models. Wooldridge test for serial correlation is used to check presence of possible dynamic effect in the panel data.

To address the problem of serial correlation, dynamic panel data models are estimated. Secondly, the relationships described above cannot be interpreted as causal until the possibility of endogeneity has been ruled out in equations (2) and (3). To address this problem, a dynamic GMM estimator (system-GMM) – also known as Arellano-Bover/Blundell-Bond linear dynamic panel-data estimation, – is used to analyse changes across countries and over time.[4] The system-GMM estimator uses lagged levels and differences between two periods as instruments for current values of the endogenous variable, together with external instruments. This approach ensures that all information will be used efficiently, and that focus is placed on the impact of regressors (such as trade openness) on inequality, and not vice versa. In this paper, with many panels with few time periods, a system estimator as suggested by Blundell and Bond (1998) is used. Some post-estimation tests are required to check the consistency of estimators. For each model Sargan test is done to check the validity of over-identifying restrictions.

Empirical Results and Discussion

Table 2a in Appendix 3 shows descriptive statistics of Gini index and other variables. It can be seen that Gini index varies between 16.64 and 65.77. Per capita GDP, on the other hand, varies from 146.398 and 61662.47 US dollar. The sample thus includes countries with very low income to very high income The dependent variable, Gini index, is very closely normally distributed as skewness and kurtosis coefficients are close to zero and three respectively. High and significant correlation is found between per capita GDP and financial infrastructure, and between physical infrastructure and human capital index (see Table 3).

Graphs in Appendix 3 (Figure 2) show relation of inequality with other explanatory variables. It can be seen that when inequality has a negative relation with per capita GDP, trade openness, FDI, physical and financial infrastructures, and human capital, it has the opposite relation with tariff and inflation. Table 4 in Appendix 4 shows estimation results of equations (1), (2) and (3). In case of all five models, the Bruesh-Pagan Lagrange multiplier test rejects the estimation using simple OLS technique and strongly recommends the use of panel data estimation methods. Similarly, presence of serial correlation is found in all five cases and hence, dynamic panel data analysis ultimately carried out. On the other hand, Durbin-Wu-Hausman test shows presence of endogenity and in all four models (model 2 to 5) considered with per capita GDP as an endogenous variable.

Results of all 5 models show lagged Gini to be positively significant indicating path dependence of inequality. Past inequality is found to increase inequality in the present. Model 1 is the baseline model that considers only two explanatory variables, namely log per capita GDP and its square. Both are found to be significant when square of log per capita GDP has a negative sign. This clearly proves the inverted U-shaped relationship between GDP growth and inequality as proposed by Kuznets (1963). Using both cross country and time series data, Kuznets (1963) found an inverted U-shaped relation between income inequality and GNP per capita. It is noteworthy that the first model however does not satisfy the Sargan test possibly due to consideration of too few explanatory variables.

In model 2, some more macroeconomic variables are included along with per capita GDP. This model shows the impact of globalisation on income inequality.

From estimation of model 2 given in Table 4, it is seen that trade openness has a negative impact on income inequality. An increase in trade openness by one unit reduces inequality by 0.05 units. Trade liberalisation is also found to have a positive impact on reduction of inequality. A one unit increase in tariff increases inequality by 0.02 units. It is found that FDI can significantly reduce income inequality, though in a very small magnitude compared to other factors. However, there is no significant impact of inflation on inequality. The p value of the Sargan test gives evidence in favour of over-identifying moment conditions and hence consistent estimates. In model 3, lag of few explanatory variables are considered. Though the second lag of Gini was insignificant in model 2, in model 3 it turns out to be significant. Tariff and its first lag are found to be significant; thus showing trade liberalisation to have both short run and long run impact on inequality. Interestingly, when tariff has a positive sign, its first lag has a negative sign. Thus in short run, reduction of tariff barriers can reduce inequality; in long run it can increase the former. Though ambiguous results are found when cross country evidences are studied or time series data are estimated, panel data estimation helps us to find the correct result when all possible endogenity related problems are taken into account. The p value of the Sargan test shows that the null hypothesis of over-identifying moment conditions is accepted.

The estimation of last two models (models 4 and 5) consider infrastructure variables along with "traditional" causes of inequality. In model 5, again lags of all explanatory variables are considered, and both models 4 and 5 show consistent estimates as the p value of the Sargan test gives evidence in favor of over-identifying moment conditions. Results of model 4 show that infrastructure has a significant negative impact on income inequality. It implies that infrastructural development within a country helps to reduce thus income inequality. One unit increase in infrastructure index can reduce inequality by 0.07 units. Lag of infrastructure has a significant negative impact on income inequality. However, there is no significant impact of human capital on income inequality. It is an interesting result in the sense that while human capital development is necessary for capability building, it is not an important factor in inequality reduction. Lag of human capital index found to be insignificant (see model 5). Public investment in social infrastructure development should target the deprived section of the society. On the other hand, quality of infrastructure is found to reduce inequality. Financial infrastructure is found to reduce income inequality as well. More financial development or improvement of financial infrastructure thus helps to reduce income inequality. Consideration of lag for financial infrastructure increases the magnitude of its coefficient, though its lag is not found to be significant. Results further show that urbanisation index has a positive significant effect on inequality (see model 4). Even though contemporaneous urbanisation tends to increase inequality, it has a lagged negative effect. Distribution of land also plays an important role to reduce income inequality. Urbanisation and its lag (in model 5), are found to be significant but of opposite sign. When urbanisation has a positive sign, its lag has a negative sign; which implies that while urbanisation increases inequality in short run, it reduces inequality in the long run. As measurement of urbanisation in this study can also be described as an indicator of migration, the results thus show that migration causes an increase in income inequality in the short run. Similarly, urbanisation can also be seen as an indicator of infrastructural development in urban areas; that can only possibly reduce inequality in the long run.

Conclusions and Policy Implications

The main objective of the study is to arrive at specific policies in order to achieve targets under SDG 10 on reduction of inequality across and within countries. Though targets under SDG 10 aim at adoption of sound macroeconomic policies, they fail to show any specific direction and suggest any indicator through which those targets can be met. Trade liberalisation and infrastructural development are chosen as two policy instruments to reduce inequality by achieving targets. Considering all possible factors that can help to reduce income inequality of a country, this empirical study contributes to the literature in many significant ways. The empirical results are comprehensive in the sense that a panel of a large number of countries over a long time period is considered for this purpose. On the one hand, the results support the orthodox Kuznets hypothesis, on the other they show important dimensions of inequality reduction through possible elimination of trade barriers and/or infrastructural bottlenecks thereby reduce transaction costs.

The results show that globalisation certainly plays an important role in reducing income inequality as trade leads to redistribution of income in favour of the poorer section of the society or people owning the abundant factors. It is also shown that this is only necessary in the sense that additional efforts from the governments through sound macroeconomic policies such as tariff reduction, removal of non-tariff barriers and investment in physical and social infrastructure are required. Financial development also plays an important role as it empowers the deprived sections of the society through access to credit. Urbanisation can be seen as an indicator of infrastructural development that might reduce inequality in the long run; even though it increases inequality in the short run. This result is similar to Kuznets's theory that in the early phase of industrialisation, rapid urbanisation may increase income inequality and then reduce the same in the long run. This result thus ensures that SDG target 10.7 can be achieved through urbanisation policies as well.

Endnotes

1 For a detail survey of infrastructure-distribution link see Estache, Foster and Wodon (2002), Esctache (2003) and Calderon and Serven (2003).

2 Data for New Zealand is not available.

3 A detailed discussion of data sources is given in Appendix 2.

4 First introduced by Arellano and Bond (1991).

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Appendix 1

Table 1: Inequality Across Countries

		1990s							2000s						
		Income Share			Income Share				Income Share			Income Share			
Continent	Country	Highest 20%	Lowest 20%	Difference between Quintiles	Highest 10%	Lowest 10%	Difference between Deciles	Gini	Highest 20%	Lowest 20%	Difference between Quintiles	Highest 10%	Lowest 10%	Difference between Deciles	Gini
Africa	Botswana	65	3.13	61.87	51.2	1.3	49.91	61	67.3	2.56	64.7	51.4	0.9	50.41	62.6
Africa	Burkina Faso	55.1	5.51	49.62	41	2.3	38.64	48.8	48.4	6.27	42.1	33.1	2.7	30.4	41.5
Africa	Burundi	44.8	6.54	38.27	29.7	2.6	27.11	37.9	42.8	8.96	33.79	28	4.1	23.9	33.3
Africa	Cameroon	51.6	6.2	45.36	36.5	2.8	33.78	44.6	48.3	6.26	42.04	32.8	2.7	30.09	41.4
Africa	Central African Republic	65	1.99	62.99	47.7	0.7	47.04	61.3	55	4.29	50.71	39.6	1.7	37.92	49.9
Africa	Egypt, Arab Rep.	40.5	9.11	31.39	26.4	4	22.37	31.1	41.3	9.05	32.24	27.5	3.9	23.61	31.9
Africa	Ethiopia	43.6	8.17	35.4	29.6	3.4	26.22	35	40.6	8.61	32.02	26.6	3.6	22.95	31.7
Africa	Gambia, The	55.3	4.02	51.23	38.2	1.6	36.56	50.2	52.8	4.79	48.05	36.9	2	34.99	47.3
Africa	Ghana	46	6.13	39.9	30	2.5	27.52	39.4	48.6	5.24	43.31	32.8	2	30.72	42.8
Africa	Guinea	50.5	4.15	46.33	33.3	1.6	31.68	45.9	45	6.77	38.2	29.7	2.8	26.91	37.8
Africa	Guinea-Bissau	53.5	5.15	48.35	39.2	2.1	37.13	47.8	43.2	7.28	35.93	28.1	3.1	25.08	35.5
Africa	Kenya	54.1	4.8	49.33	39.4	1.9	37.48	48.6	53.2	4.84	48.36	38	2	36.03	47.7
Africa	Lesotho	64.4	2.05	62.34	46.2	0.7	45.51	60.6	56.7	2.94	53.78	39.7	1	38.66	52.9
Africa	Madagascar	48.6	5.69	42.92	33.1	2.3	30.81	42.4	49.3	6.14	43.18	33.9	2.5	31.45	42.3
Africa	Malawi	56	4.84	51.12	42	1.9	40.08	50.3	49.8	6.16	43.6	35.1	2.5	32.57	43.1
Africa	Mali	56.1	4.64	51.46	40.6	2	38.58	50.5	44.7	6.87	37.78	28.9	2.9	26	37.3
Africa	Mauritania	50.1	5.78	44.29	35.4	2.3	33.15	43.7	46.9	6.17	40.72	31.5	2.5	28.95	40.3
Africa	Morocco	46.4	6.55	39.87	30.8	2.8	27.99	39.3	47.8	6.5	41.3	32.8	2.7	30.04	40.8
Africa	Mozambique	50.7	5.63	45.06	35.9	2.2	33.73	44.5	52.4	5.33	47.05	38	2	35.94	46.4
Africa	Namibia	78.3	1.48	76.77	65	0.6	64.39	74.3	67.4	3.26	64.13	53.3	1.4	51.83	62.6
Africa	Niger	46	6.74	39.28	31.1	2.8	28.34	38.8	45.2	7.38	37.77	30.6	3.1	27.47	37.3
Africa	Nigeria	50.7	4.5	46.24	34.3	1.7	32.66	45.7	47.5	5.51	41.99	31.4	2.2	29.2	41.5
Africa	Senegal	53.5	4.98	48.55	38.4	2	36.37	47.8	47.1	6.28	40.77	31.6	2.6	28.97	40.3
Africa	Seychelles	48.9	5.68	43.23	34	2.1	31.86	42.7	69.6	3.71	65.92	60.2	1.6	58.52	65.8
Africa	South Africa	63.1	3.26	59.82	45.9	1.4	44.49	58	68.3	2.67	65.58	52	1.1	50.84	63.3
Africa	Swaziland	64.3	2.74	61.59	49.9	1	48.81	60.7	57.9	4.35	53.54	42.2	1.9	40.37	52.4
Africa	Tanzania	41.6	7.43	34.18	26.6	3	23.57	33.8	44.3	7.17	37.11	29.2	3	26.2	36.7
Africa	Tunisia	47.1	5.76	41.34	31.2	2.3	28.93	41	44.9	6.39	38.54	29.3	2.6	26.7	38.1
Africa	Uganda	47.9	6.43	41.42	33.1	2.7	30.46	40.9	50.8	5.85	44.96	35.9	2.4	33.44	44.3
Africa	Zambia	56.3	3.54	52.77	40.2	1.3	38.88	52	56.4	4.24	52.15	40.8	1.7	39.11	51.2
Asia	Bangladesh	39.9	9.14	30.8	25.7	4	21.64	30.5	42.2	8.78	33.37	27.8	4	23.79	32.9

Asia	Cambodia	46.8	8.04	38.79	33	3.7	29.32	38.3	43.9	8.05	35.81	29.1	3.6	25.54	35.3
Asia	China	43.4	7.26	36.09	27.5	3.1	24.37	35.7	47.9	4.98	42.91	31.2	1.9	29.29	41.4
Asia	India	40.1	9.09	31.05	26	4	22.03	30.8	42.6	8.59	34	28.5	3.7	24.81	33.6
Asia	Indonesia	39.4	9.36	30.04	25.3	4.2	21.18	29.7	42.2	8.4	33.77	27.5	3.7	23.81	34.3
Asia	Iran, Islamic Rep.	49.5	5.29	44.18	33.5	2.1	31.41	43.6	45.2	6.43	38.73	29.6	2.6	27.01	38.3
Asia	Israel	43.4	6.53	36.86	27.6	2.6	24.95	36.8	46.3	4.99	41.29	29.9	1.8	28.09	41.3
Asia	Jordan	47.2	6.78	40.42	32.4	2.9	29.51	39.9	43.1	7.87	35.2	28.2	3.4	24.79	34.8
Asia	Kazakhstan	41.4	7.17	34.24	25.7	2.9	22.73	34	39.1	8.65	30.41	24.2	3.6	20.54	30.3
Asia	Kyrgyz Republic	50.3	4.84	45.45	34.1	1.9	32.2	44.8	41.9	7.75	34.14	26.4	3.2	23.22	33.8
Asia	Lao PDR	41.7	8.65	33.03	27.4	3.8	23.61	32.7	43.2	8.06	35.15	28.7	3.5	25.16	34.7
Asia	Malaysia	53.8	4.51	49.25	37.8	1.8	35.96	48.4	49.2	5.23	43.98	32.7	2.1	30.62	43.4
Asia	Maldives	65.7	1.41	64.33	48.1	0.4	47.75	62.7	44.2	6.51	37.73	28	2.7	25.32	37.4
Asia	Mongolia	39.5	7.55	31.91	23.9	3.1	20.89	31.7	42.3	7.28	34.99	26.6	3.1	23.53	34.7
Asia	Nepal	43.5	7.87	35.65	29.1	3.4	25.69	35.2	46.2	7.4	38.82	31.6	3.3	28.34	38.3
Asia	Pakistan	40.9	8.93	31.99	26.9	3.9	22.95	31.6	40.5	9.35	31.12	26.6	4.2	22.42	30.8
Asia	Philippines	50.8	5.73	45.05	35	2.5	32.5	44.3	50.6	5.66	44.89	34.3	2.4	31.91	44.1
Asia	Russian Federation	49.4	5.01	44.39	33.8	1.8	32	44	45.5	6.51	38.97	29.5	2.6	26.93	38.4
Asia	Slovak Republic	33.1	10.3	22.81	19.5	4.1	15.41	22.7	37.1	9.25	27.84	23	3.8	19.24	27.6
Asia	Sri Lanka	42.7	8.37	34.34	28.3	3.7	24.62	34	46.9	7.14	39.8	32.2	3.1	29.07	39.2
Asia	Tajikistan	38.1	8.34	29.77	23.3	3.3	20.05	29.5	40.4	7.87	32.57	25.4	3.1	22.25	32.3
Asia	Thailand	50.9	6.01	44.91	35.1	2.5	32.59	44	48.5	6.4	42.08	32.7	2.7	29.99	41.4
Asia	Turkey	47.7	5.8	41.88	32.3	2.3	29.99	41.5	46.3	5.66	40.59	30.2	2.1	28.09	40.1
Asia	Uzbekistan	49.6	3.91	45.65	33.4	1.1	32.27	45.3	42.7	7.79	34.86	27.8	3.1	24.74	34.2
Asia	Vietnam	44	7.92	36.08	29.2	3.5	25.64	35.6	44.3	7.13	37.21	29	3	25.98	36.8
Asia	Yemen, Rep.	41.2	7.41	33.75	25.9	3	22.88	33.4	44.2	7.84	36.31	29.9	3.3	26.61	35.9
Europe	Armenia	47.3	6.57	40.73	32.4	2.7	29.69	40.2	41.6	8.49	33.07	27.3	3.6	23.69	32.7
Europe	Austria	38.6	7.64	31	23.5	2.8	20.76	31	38.1	8.51	29.61	23.4	3.3	20.03	29.5
Europe	Azerbaijan	42.3	6.94	35.31	27	2.8	24.29	35	34.5	11.2	23.29	21.1	5	16.08	23.1
Europe	Belarus	36	9.4	26.62	21.7	3.9	17.79	26.5	36.9	8.94	27.99	22.3	3.7	18.66	27.9
Europe	Belgium	36	9.03	26.92	21.5	3.5	18.04	26.8	41.7	8.35	33.34	28.3	3.3	25.03	33.1
Europe	Bulgaria	37.9	9.09	28.81	23.6	3.8	19.85	28.5	40	7.23	32.74	25	2.6	22.36	32.4
Europe	Croatia	37.1	9	28.13	22.5	3.7	18.87	28.1	39.9	8.36	31.54	25.1	3.5	21.59	31.2
Europe	Czech Republic	36.7	10.3	26.41	23.2	4.5	18.68	26.2	36.4	9.45	26.99	22.6	3.8	18.81	26.5
Europe	Denmark	34.2	9.93	24.29	20.2	3.8	16.42	24.3	35.1	9.68	25.45	21	3.7	17.3	25.4
Europe	Estonia	43.2	7.16	36.05	27.9	3	24.99	35.7	41.3	7.27	34.01	25.9	2.7	23.26	33.6
Europe	Finland	34.1	10.7	23.32	20.1	4.6	15.54	23.2	37.3	9.32	27.99	23	3.8	19.18	27.9
Europe	France	40.5	7.92	32.62	25.7	3.2	22.47	32.4	39.6	7.94	31.69	24.6	3.2	21.4	31.5
Europe	Georgia	45.8	5.44	40.4	30.1	1.9	28.14	40.1	46.5	5.46	41.02	30.5	1.9	28.51	40.6
Europe	Germany	38.4	8.31	30.13	23.7	3.3	20.37	30	39.4	8.38	31.05	24.7	3.4	21.34	30.9
Europe	Greece	43.3	5.78	37.5	27.4	1.9	25.49	37.2	41.1	6.7	34.38	25.8	2.3	23.51	34.2
Europe	Hungary	37.1	9.58	27.55	23.2	4	19.13	27.4	37.4	8.78	28.66	23	3.6	19.4	28.5

Europe	Ireland	44.1	6.96	37.09	28.4	2.8	25.62	36.5	40.7	7.76	32.93	25.7	3.1	22.65	32.7
Europe	Italy	41.6	6.36	35.23	26.3	2.2	24.18	35.1	42.4	6.2	36.2	27.2	2.1	25.03	36.1
Europe	Latvia	39.2	8.04	31.2	24.7	3	21.68	31	42.5	6.66	35.85	27	2.4	24.61	35.5
Europe	Lithuania	40.8	7.87	32.94	26.2	3.1	23.05	32.7	41.5	7.14	34.32	26.2	2.7	23.5	34
Europe	Macedonia, FYR	36.7	8.48	28.2	22.1	3.3	18.88	28.1	45.9	5.88	40	30	2.3	27.7	39.6
Europe	Moldova	45	6.38	38.61	29.4	2.5	26.93	38.1	42.2	7.43	34.78	27	3	23.97	34.5
Europe	Netherlands	38.8	7.8	30.96	23.2	2.5	20.68	30.7	38.5	8.2	30.3	23.9	3	20.91	30.1
Europe	Norway	35.8	9.44	26.32	21.4	3.8	17.63	26.4	37.1	9.2	27.87	23.1	3.5	19.58	27.8
Europe	Poland	39.6	8.4	31.22	24.8	3.5	21.26	31.1	41.6	7.7	33.89	26.4	3.2	23.27	33.7
Europe	Romania	37.1	8.82	28.24	22.5	3.6	18.86	28.1	37.9	8.48	29.37	23	3.5	19.56	29.3
Europe	Slovenia	38.2	9.19	28.99	23.8	4	19.81	28.8	36.1	9.3	26.82	21.8	3.8	17.97	26.7
Europe	Spain	41.8	6.78	35.05	26.4	2.4	24.02	34.7	40.8	6.48	34.29	25.2	2.1	23.08	34.1
Europe	Sweden	34.6	9.23	25.36	20.1	3.4	16.72	25.5	36.2	9.32	26.84	21.8	3.7	18.07	26.8
Europe	Switzerland	42.5	5.32	37.2	27.2	0.8	26.4	37.1	40.3	7.67	32.65	24.8	2.9	21.89	32.7
Europe	Ukraine	40.4	7.91	32.46	25.5	3.3	22.27	32.3	37.4	9.16	28.27	22.8	3.9	18.97	28.1
Europe	United Kingdom	43.5	6.32	37.17	27.9	2.2	25.66	36.9	44.2	5.98	38.17	28.7	2	26.7	37.9
North America	Canada	39.5	7.32	32.21	24.2	2.7	21.5	32	41	7.02	33.99	25.8	2.6	23.17	33.8
North America	Costa Rica	50.9	3.94	46.91	34.2	1.1	33.07	46.2	54.3	3.92	50.35	37.7	1.3	36.44	49.3
North America	Cote d'Ivoire	45.3	6.51	38.81	29.6	2.7	26.92	38.4	48.6	5.69	42.89	33	2.3	30.73	42.3
North America	Dominican Republic	54.3	4.19	50.1	38.8	1.5	37.31	49.2	54.9	4.24	50.68	39.1	1.6	37.54	49.6
North America	El Salvador	56.2	2.84	53.39	39.8	0.7	39.11	52.4	52.4	4.11	48.32	36.1	1.4	34.73	47.5
North America	Guatemala	59.7	3.14	56.53	44.8	1	43.81	55.8	58.3	3.13	55.17	42.3	1	41.25	54
North America	Honduras	58.9	3.09	55.77	42.9	1	41.93	54.6	60.1	2.52	57.61	43.7	0.8	42.94	56.5
North America	Jamaica	47.3	6.16	41.14	32	2.5	29.48	40.6	58.5	3.39	55.12	41.9	1.4	40.43	54.3
North America	Mexico	55.1	4.19	50.93	39.4	1.7	37.72	50.1	54.1	4.49	49.58	38.8	1.7	37.03	48.8
North America	Nicaragua	55.9	3.74	52.12	40.1	1.3	38.81	51.3	49.2	5.5	43.69	33.5	2.2	31.35	43.1
North America	Panama	60.5	1.55	58.99	43.1	0.2	42.94	57.6	58	2.83	55.22	41.3	0.9	40.44	54
North America	United States	44.6	5.28	39.28	28.3	1.8	26.52	39.1	46.2	4.95	41.2	30	1.5	28.53	40.9
Oceania	Australia	40.8	6.8	33.98	24.9	2.1	22.78	33.7	41.1	6.99	34.15	25.2	2.4	22.89	34.1
South America	Argentina	52.8	4	48.76	36	1.3	34.68	47.9	53.1	3.51	49.57	35.9	1.1	34.85	48.9
South America	Bolivia	57.2	3.15	54.06	40.7	1.1	39.64	53	58.3	2.41	55.87	41.9	0.6	41.29	54.7
South America	Brazil	63.1	2.42	60.65	46.6	0.7	45.9	59	60.3	2.93	57.32	44.3	0.9	43.4	55.9
South America	Chile	61	3.56	57.4	45.5	1.3	44.2	55.8	58.6	4.12	54.44	43.4	1.5	41.86	52.9
South America	Colombia	58.9	2.94	55.97	43.1	0.8	42.32	54.6	60.7	2.93	57.74	45.1	0.9	44.26	56.3
South America	Ecuador	58	3.27	54.69	42.2	0.9	41.25	53.4	56.4	3.61	52.83	40.6	1.1	39.49	51.7
South America	Paraguay	56.5	3.38	53.09	40.1	1.1	38.98	52.1	57	3.53	53.47	41.6	1.2	40.37	52.6
South America	Peru	53.6	4.49	49.08	37.8	1.7	36.1	48.1	53.6	3.93	49.68	37.5	1.4	36.12	49
South America	Uruguay	47.9	5.1	42.84	31.6	1.8	29.75	42.3	51	4.68	46.34	34.4	1.8	32.61	45.7
South America	Venezuela, RB	51.1	4.14	47	34.7	1.3	33.48	46.3	51.9	3.48	48.4	35.2	0.9	34.29	47.7

Table 1a: State-wise Comparison of Inequality

State	1974	1978	1984	1988	1994	2000	2005	2010
Andhra Pradesh	28.05	30.97	31.3	32.98	30.98	29.8	34.32	32.33
Assam	24.69	24.76	21.2	26.2	24.56	24.5	27.22	28
Bihar	25.53	27.93	27.8	25.76	25.8	24.1	28.26	27.45
Gujarat	23.94	29.97	28.4	26.78	27.06	28.6	29.52	28.69
Haryana	29.94	29.97	30.6	29	29.6	26.9	35.5	32.72
Himachal Pradesh	25.41	27.93	29	27.94	39.08	27.1	32	33.04
Karnataka	28.47	32.97	33.2	31.42	29.94	31.3	32.68	27.76
Kerala	33.82	36.73	33.6	34.02	32.62	30.4	39.92	45.48
Madhya Pradesh	28.06	35.41	30.7	31.68	32.16	29.3	34.54	32.28
Maharashtra	29.29	41.17	34.1	32.64	33.7	35.3	35.16	32.93
Orissa	29.75	30.96	28.4	28.54	28.26	27.8	32.64	31.5
Punjab	27.94	33.86	30.3	29.34	28.1	27.1	35.98	32.87
Rajasthan	28.47	38.28	35	32.74	28.18	24.6	32.36	29.64
Tamil Nadu	28.88	32.48	37.1	34.12	33.36	36.6	34.54	29.47
Uttar Pradesh	26.35	31.45	30.2	30.5	30.88	28.2	33.74	30.65
West Bengal	30.94	30.45	32.8	29.32	30.5	29.8	33.94	29.94

Source: Different Rounds of NSS data (database of Planning Commission, India, now renamed as NITI Aayog).

Appendix 2

Table 2: Description and Sources of Data

Label	Content	Sources
Inequality (INQ)	Gini coefficient	World Development Indicators
Per capita income (PCGDP)	GDP per capita (constant 2005 US$)	World Development Indicators
Trade openness (TO)	Trade (export and import) as percentage of GDP (per cent)	World Development Indicators
Trade liberalisation (Tariff)	Tariff rate applied, weighted mean, all products (per cent)	World Development Indicators
Foreign Direct Investment (FDI)	Foreign direct investment, net inflows (BoP, current US$)	World Development Indicators
Infrastructure Stock Index (ISI)	Infrastructure quantity, which is estimated using the method of principal component analysis (PCA) on normalised indicators such as (a) total road network (km); (b) air transport, passengers carried (per 1000 population); (c) per capita energy consumption; (d) internet users (per 1000 population); (e) fixed telephone subscribers (per 1000 population); (f) domestic credit provided by the public sector.	World Development Indicators
Infrastructure quality (IQ)	Electric power transmission and distribution losses (percentage of output)	World Development Indicators
Financial Infrastructure (FI)	Commercial bank branches (per 100,000 adults)	World Development Indicators
Human Capital Index (HCI)	Stock of human capital, which is estimated using the method of principal component analysis (PCA) on normalised indicators such as (a) gross primary school enrollment; (b) life expectancy at birth; (c) mortality rate, under age 5 (per 1000 live births); (d) population with access of improved drinking water; (e) population with access of improved sanitation facilities; (f) labour force participation rate; (g) total health expenditure (percentage of GDP).	World Development Indicators
Urbanisation	Ratio of urban and rural population	World Development Indicators
Land	Arable land (hectares per person)	World Development Indicators

Table 2a: Descriptive Statistics

	GINI Index	Per Capita GDP	Per Capita GDP_SQ	Tariff Rate	TO	Inflation	FDI	Infrastructure	Infrastructure Quality	Human Capital Index	Financial Infrastructure	Land	Urbanisation
Mean	38.737	11263.540	3.220E+08	4.687	0.839	7.616	1.380E+10	114.446	17.091	569.596	20.549	0.304	3.201
Median	37.630	5325.490	2.836E+07	2.790	0.741	5.725	2.250E+09	84.765	12.776	440.299	16.495	0.231	2.134
Maximum	65.770	61662.470	3.800E+09	30.660	1.794	45.191	3.400E+11	471.536	62.594	2688.487	90.610	1.507	16.902
Minimum	16.640	146.398	21432.390	0.390	0.000	-2.008	-2.090E+10	31.239	2.653	203.803	0.684	0.012	0.106
Std. Dev.	9.738	13994.740	6.800E+08	4.247	0.418	7.268	3.940E+10	85.343	12.916	390.635	16.251	0.284	3.475
Skewness	0.414	1.733	2.603	2.424	0.306	1.775	5.479	2.189	1.938	2.802	1.830	1.960	2.195
Kurtosis	2.285	4.921	9.581	11.909	2.269	7.429	38.195	7.737	6.223	12.544	7.535	7.496	7.439
Observations	189	189	189	189	189	189	189	189	189	189	189	189	189

Table 3: Correlation Matrix

	GINI Index	Per Capita GDP	Per Capita GDP_SQ	Tariff Rate	TO	Inflation	FDI	Infrastructure	Infrastructure Quality	Human Capital Index	Financial Infrastructure	Land	Urbanisation
GINI Index	1												
Per Capita GDP	-0.358*	1											
Per Capita GDP_SQ	-0.309*	0.961*	1										
Tariff Rate	0.436*	-0.383*	-0.306*	1									
TO	-0.426*	0.006	-0.023	-0.339*	1								
Inflation	0.152*	-0.394*	-0.327*	0.227*	0.003	1							
FDI	-0.021	0.432*	0.414*	-0.149*	-0.188*	-0.124*	1						
Infrastructure	0.085	0.022	0.030	0.000	-0.013	-0.063	-0.009	1					
Infrastructure Quality	0.229*	-0.210*	-0.169*	0.143*	-0.042	0.023	-0.015	0.167*	1				
Human Capital Index	-0.014	0.084	0.087	-0.064	0.045	-0.092	0.007	0.931*	-0.014	1			
Financial Infrastructure	-0.142*	0.485*	0.435*	-0.280*	0.004	-0.302*	0.150*	0.234*	0.043	0.181*	1		
Land	-0.251*	0.089	0.074	-0.200*	-0.015	0.217*	0.176*	-0.027	0.128*	-0.059	-0.025	1	
Urbanisation	0.173*	0.252*	0.248*	-0.097	-0.271*	0.073	0.042	0.142*	-0.098	0.117*	0.121*	0.253*	1

Note: * implies significance at 5 per cent level.

Appendix 4

Figure 2: Relation between Inequality and other Macro Variables

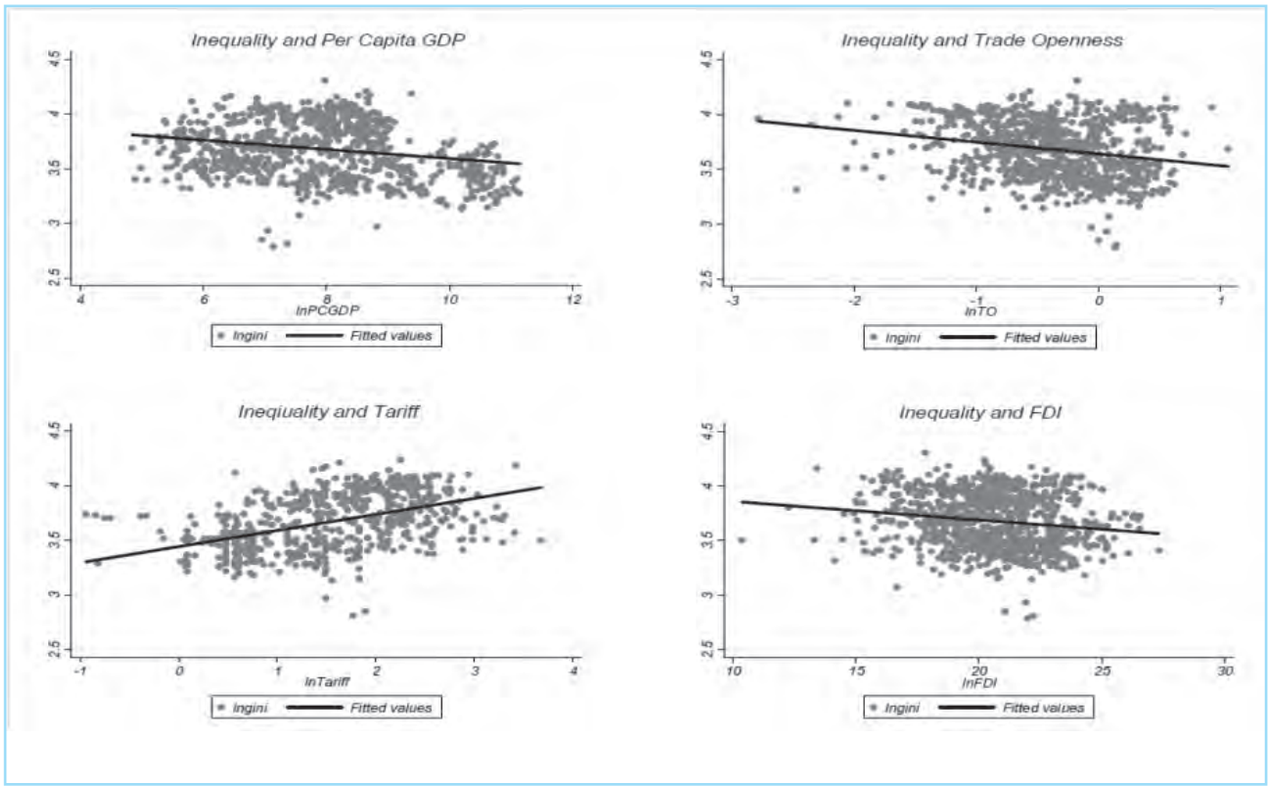
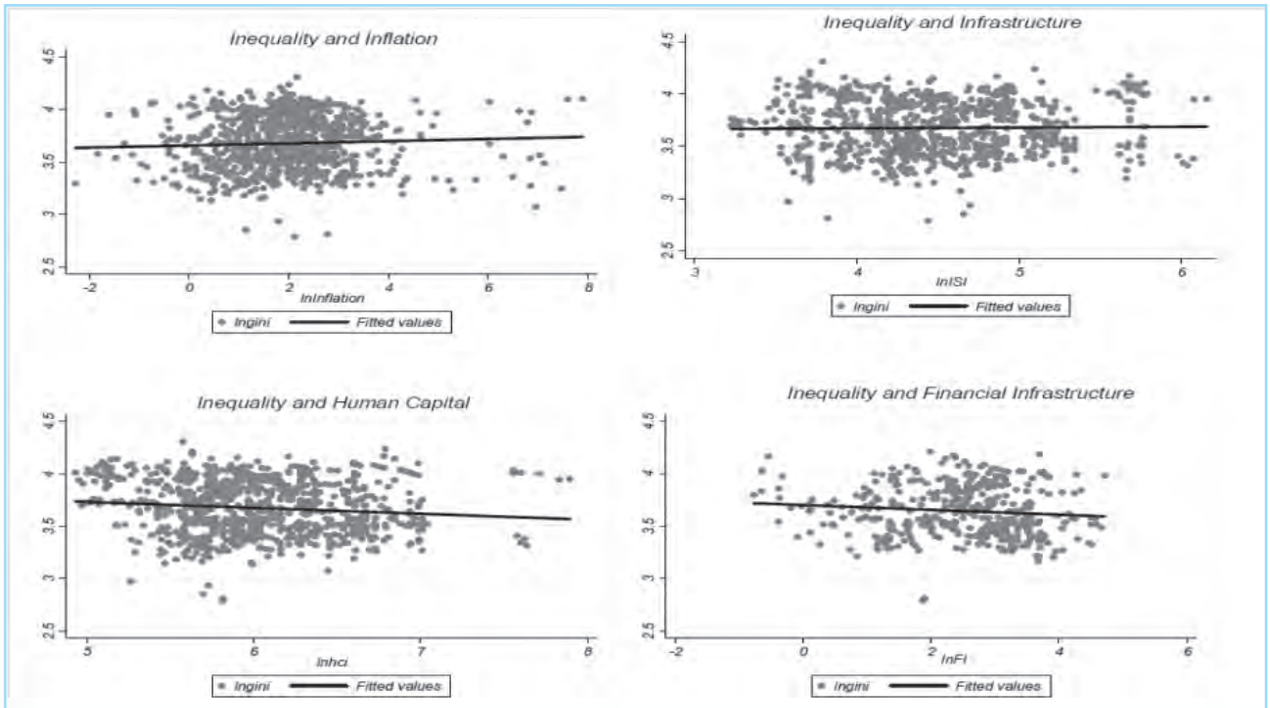


Figure 3: Relation between Inequality and other Macro Variables (continued)



Appendix 4

Table 4: Determinants of Income Inequality

Dependent Variable: lnGini			
	Model 1	**Model 2**	**Model 3**
ln Gini L1	0.6885364*** (0.030554)	0.72827*** (0.0491846)	0.0752345*** (0.0539454)
ln Gini L2		0.0377768 (0.0517835)	0.1186454** (0.0502608)
lnPCGDP	0.5656235*** (0.1795454)	-0.022904* (0.0132404)	0.2314531* (0.1315622)
lnPCGDP_sq	-0.0386083*** (0.0114081)		-0.0145234* (0.007857)
lnTO		-0.046435* (0.0259047)	-0.0082476 (0.0245453)
lnTariff		0.0176992* (0.0098832)	0.0450609*** (0.0119304)
lnTariff L1			-0.0225347** (0.0105994)
lnInflation		-0.0015636 (0.0048268)	-0.0069166 (0.0045763)
lnFDI		-0.000499 (0.0044332)	0.0061923 (0.0051241)
lnFDI L1			-0.0086181* (0.0051241)
Constant	-0.8683673 (0.6834259)	1.026879*** (0.2448164)	-0.4085665 (0.5977322)
No. of Instruments	227	157	158
Sargan test p value	0.0012	0.7099	0.7823

Note: (a) standard errors are mentioned in parentheses;

(b) *** denotes significance at 1 per cent level, ** denotes significance at 5 per cent level, and * denotes significance at 10 per cent level;

(c) L1 and L2 denote first and second lags respectively.

Table 4: Determinants of Income Inequality (contd.)

Dependent Variable: lnGini		
	Model 4	**Model 5**
ln Gini L1	0.3893619*** (0.0772508)	0.4117642*** (0.0760743)
ln Gini L2	0.1266494 (0.0788206)	
lnPCGDP	-0.139795*** (0.0249953)	-0.0944781*** (0.0203502)
lnISI	-0.0746297** (0.0350597)	0.0275785 (0.051195)
lnISI L1		-0.0862694** (0.0434007)
lnInfraQ	-0.0507057** (0.0246196)	0.0206315 (0.0245602)
lnInfraQ L1		-0.0509874* (0.0284099)
lnHCI	0.0766996 (0.0487024)	-0.0236148 (0.0659693)
lnHCI L1		0.0764929 (0.0502853)
lnFI	-0.0398411** (0.0171768)	-0.0691487* (0.0359944)
lnFI L1		0.0501564 (0.0398771)
Urbanization	0.0273234*** (0.0043052)	0.8298549** (0.3548481)
Urbanization L1		-0.8506233** (0.3691776)
lnLand	-0.0710673 (0.0372081)	-0.0632297 (0.0440273)
Constant	2.817942*** (0.509128)	2.898507*** (0.4619027)
No. of Instruments	117	100
Sargan test p value	0.1615	0.3858

Note: (a) standard errors are mentioned in parentheses;
(b) *** denotes significance at 1 per cent level, ** denotes significance at 5 per cent level, and * denotes significance at 10 per cent level;
(c) L1 and L2 denote first and second lags respectively.

Annex

Goal 10: Reduce inequality within and among countries: Targets and Indicators	
10.1 By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average	10.1.1 Growth rates of household expenditure or income per capita among the bottom 40 per cent of the population and the total population
10.2 By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status	10.2.1 Proportion of people living below 50 per cent of median income, by age, sex and persons with disabilities
10.3 Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard	10.3.1 Proportion of the population reporting having personally felt discriminated against or harassed within the previous 12 months on the basis of a ground of discrimination prohibited under international human rights law
10.4 Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality	10.4.1 Labour share of GDP, comprising wages and social protection transfers
10.5 Improve the regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations	10.5.1 Financial Soundness Indicators
10.6 Ensure enhanced representation and voice for developing countries in decision-making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions	10.6.1 Proportion of members and voting rights of developing countries in international organizations
10.7 Facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies	10.7.1 Recruitment cost borne by employee as a proportion of yearly income earned in country of destination 10.7.2 Number of countries that have implemented well-managed migration policies
10.a Implement the principle of special and differential treatment for developing countries, in particular least developed countries, in accordance with World Trade Organization agreements	10.a.1 Proportion of tariff lines applied to imports from least developed countries and developing countries with zero-tariff
10.b Encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programmes	10.b.1 Total resource flows for development, by recipient and donor countries and type of flow (e.g. official development assistance, foreign direct investment and other flows)
10.c By 2030, reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 per cent	10.c.1 Remittance costs as a proportion of the amount remitted

11
Incorporating Resilience and Inclusiveness in Policy Framework of Urban Development: Indian Case

Introduction

Initiatives for putting resilience in the centre-stage of global action agenda or positing it as the key requirement for sustainable development have become the major challenge in the Post Kyoto-Doha declaration era. In addition, there is a need to counter the exclusionary pattern of urbanisation, resulting in deceleration in growth of urban population, shrinking of cities, slowing down of the pace of rural urban migration and sectoral diversification. It would therefore be important to work out a strategy to make the settlement pattern, particularly for the large cities, resilient and inclusive. The necessity of analysing the spatial implications of such a strategy and building a robust framework for its implementation and monitoring in a large country with a fast growing economy cannot be overemphasised. This would require an understanding of the environmental implications of present structure of human settlements. The impact of a top heavy pattern of urbanisation in Asia Pacific region, energy costs of vertical growth in large and non-inclusive cities and that of bringing water and basic necessities from long distances and the cost implications of maintaining the lifestyles in these cities must be examined in considerable detail. It is only then that a framework to shift to a different paradigm of making the settlement structure more inclusive and sustainable can be proposed and the outlines of a monitoring system can be detailed. An attempt has been made in this paper to build up such a framework, taking India as a case study.

The analysis has been carried out in five sections. The second section, which follows the introductory section, presents the context for the adoption of the Sustainable Development Goals (SDGs) by 193 member states in 2015, that endorsed integration of climate actions into policies and programmes to reduce poverty, hunger and inequality, by making the settlement structure more eco-friendly and inclusive. It underlines how the Millennium Development Goals (MDGs) and the proposed targets for provisioning of basic amenities that were enunciated without having a perspective of settlement structure led to emergence of serious spatial disparities, smaller urban settlements and rural areas recording significant deficits in Asia Pacific region, in general, and India, in particular. It makes a case for setting up specific targets relating to settlement hierarchy and spatially disaggregated environmental goals and operationalisation of a monitoring system, based on robust statistical evidence. The third section raises certain conceptual issues relating to proposing of the SDG 11 in the background of limited success of MDGs and deliberates on a few operational issues in implementing the former within the present system of governance. The next section analyses the programmes and policies followed during the past decade in India, highlighting how sustainability issues received scanty attention. It proceeds to identify the areas of concern in the context of the trends and pattern of urbanisation in the country focussing on the deprivations in different size class of urban settlements. In the fifth section, a scenario of sustainable urbanisation has been worked out at the macro level. The last section proposes a framework for implementation and monitoring of the strategy which can lead to better outcome indicators in terms of inclusivity and sustainability and make

it possible for the country to showcase its initiatives of moving on the path of sustainable development, as per its global commitment. This would help in demonstrating India's seriousness in meeting the SDGs, facilitate bilateral and multilateral dialogues and build political pressure on other countries exhibiting reluctance in compliance.

The Challenge and Context

The challenge of building a resilient system in a country having the elasticity to absorb the disturbances arising from anthropogenic factors and return back to a dynamic growth path, by shifting from one steady state to another, is enormous. This is because the efforts of an individual country, howsoever large, can make only marginal effect since the world architecture concerned with the problems of Climate Change has not yet found a mechanism that can mandate compliance with a strong system of incentives and penalties for all the countries in the world.

The countries at low and middle level of development including India and China, generally stand with the principle of equal but differentiated responsibility and blame the developed countries for sabotaging it. This enunciates a normative position that the less developed countries, including the emerging economies, must be exempted from the compliance norms, at least for a couple of decades, as they have serious deficits in most of the MDG targets pertaining to social and economic development. It is, however, unlikely that this ethically grounded position, which constituted the basis for global architecture for Climate Change in the past couple of decades, would carry significant weight in current international negotiations, given the extreme inequity in political and economic power. Many of the emerging economies are willing to put a cap on their emissions when they reach the per capita figure of the industrialised countries. Evidently, if each country makes such conditional commitments, the business as usual scenario would prevail due to game theoretic considerations, pushing the global temperature well beyond 2 degree Celsius, threatening life and livelihood of entire humanity. Per capita emission equivalent to that of the world average for all less developed countries is not sustainable, and hence the need for a paradigm shifts in development strategy.

There seems to be a general agreement that if the rise in global temperature has to be contained to 2 degree Celsius, the level of fossil fuel consumption must be brought to half of the level of the pre-industrialisation period by 2050. By the most conservative projections, the global income will be three and a half times of the present level by that time, Asian economies growing at 6.5 per cent per annum. Given the 350 per cent increase in world GDP and the stipulated reduction in energy consumption, noted above, we need to increase carbon efficiency seven times of the present level or an 700 per cent increase in the productive capacity of energy. It is high time that all countries seriously consider issues of sustainability of their present path of development and lifestyle. Focus would be on the emerging settlement structure, its energy efficiency and inclusivity, the implications of which have been discussed in the following sections. They must consider the possibilities of reorganisation of economic activities and settlement structure for attaining required resource efficiency.

What is more worrying is that the global summits and international conventions are still discussing the reduction in emission by 30 to 40 per cent only by 2030. The importance of such conventions must, therefore, not be exaggerated. Although our success since the 1990s has not been stunning, it is argued that 40 per cent reduction is not difficult to achieve through forestation programmes and adoption of available technologies. Many among the national governments are showing willingness to accept even higher targets. There is growing realisation in the UN that the "gap between scientific evidence and political response" is growing. This provides the context for the adoption of the SDGs, that besides taking care of the unmet targets of the MDGs, would combine these with concerns for sustainability. The key issue here would be how to set specific targets at national level and transform them into city level or programme-based norms and ensure their compliance.

Regional MDGs Report 2014-15[1] for Asia-Pacific reveals that this region which accounts for more than half the world's population and has two of the most dynamic economies, China and India, has helped the world in achieving major breakthrough in meeting the MDGs. The serious deficits, however, have been noted in all sub-regional units in terms of

the prescribed health targets, particularly linked to children and women. This is compounded by the fact that the progress in achieving basic sanitation has been extremely tardy. In case of educational targets such as completion of the final year of primary education and achieving gender parity, South East Asia and South and South West Asia emerge as areas of concern. Similarly, in maintaining the forest land, South East Asia and East and North East Asia give alarm signals.

India is a better performer in most of the MDGs which possibly can be attributed to its relatively higher growth in GDP in recent years. The country is among the early achievers in terms of the goals of poverty reduction, enrolment in and completion of primary education, gender parity in primary education and controlling HIV Aids and tuberculosis. The major deficits, however, are in tertiary education and gender parity in that. The very high dropout rates particularly in rural areas and smaller urban settlements are responsible for this shortfall. The other equally important concern is the deficit in skill development and here again the disparity across size class of settlements is extremely high. The Regional MDGs Report 2014/15 further confirms that India has made very slow progress in achieving the targets in the field of health. Significant gaps are noted in meeting the infant and under five mortality goals as also of maternal mortality. Alarming deficits are noted in the provisioning of basic sanitation which would partly explain the disastrous outcome in health for the country and the region. The satisfying point, however, is that in no dimension India reports a total stagnation or regression. It is evident that in the spheres wherein the targets have been missed, there has been substantial progress which could serve as a launching pad for the sustainable development in coming years, as noted in the Report.

To maintain this momentum in the period after 2015 and feed that into achieving the SDGs, the region must address the bottlenecks in extending the benefits of technologies to all – particularly the population living in less developed regions, villages and small urban centres. This has to be accepted as the key challenge in the Post MDG agenda. The second challenge is implementing and monitoring various missions and programmes launched by different countries with reference to the SDGs. The Report considers that this is not possible unless a robust statistical system is built that can help in constructing reliable outcome indicators so that the benefits occurring particularly to the backward regions and poorest groups can be monitored and corrective actions taken.

Conceptual Issues of the SDG 11 and Concerns for Operationalisation

Many of the SDGs have been considered as mere extensions of the MDGs at conceptual as well as operational level. The former, however, are envisaged to bring about a global systemic reform to remove the impediments that came in the way of achieving the MDGs, exert greater international pressure for compliance, covering population of all regions and settlements. The SDGs from one to seven are, indeed, similar to those of MDGs, the only difference being that the mandate is more comprehensive and inclusionary, stipulating mitigation of developmental deficits in different regions, settlement categories and for different sections of population.

The SDG 11 of 'Making Cities and Human Settlements Inclusive, Safe Resilient and Sustainable' is one of the major goals designed to integrate climate action into policies and programmes to reduce poverty and deprivation. It lays down a framework for ensuring sustainability of settlement structure and the process of urbanisation. It envisages provisioning of housing, basic amenities, open green space, healthier micro environment, efficient transport system, capacity building for better governance, protection against disaster and safeguarding heritage (Annexure I). The first 7 of the 10 targets pertain to what needs to be done within the cities and the other 3 envisage urban development policies in regional context. This goal is expected to be achieved through an urban development strategy which allows all stakeholders, including the citizenry to actively participate in social and economic life.

Two of the targets under SDG 11 stipulate that a sustainable city must provide access to safe, affordable, accessible and sustainable transport and create green and public spaces for all by 2030. The success in achieving these targets will enable meeting the targets in several other SDG goals. The improvement of the transportation system with emphasis of public transit would automatically improve access to education, health and employment, in particular for women and

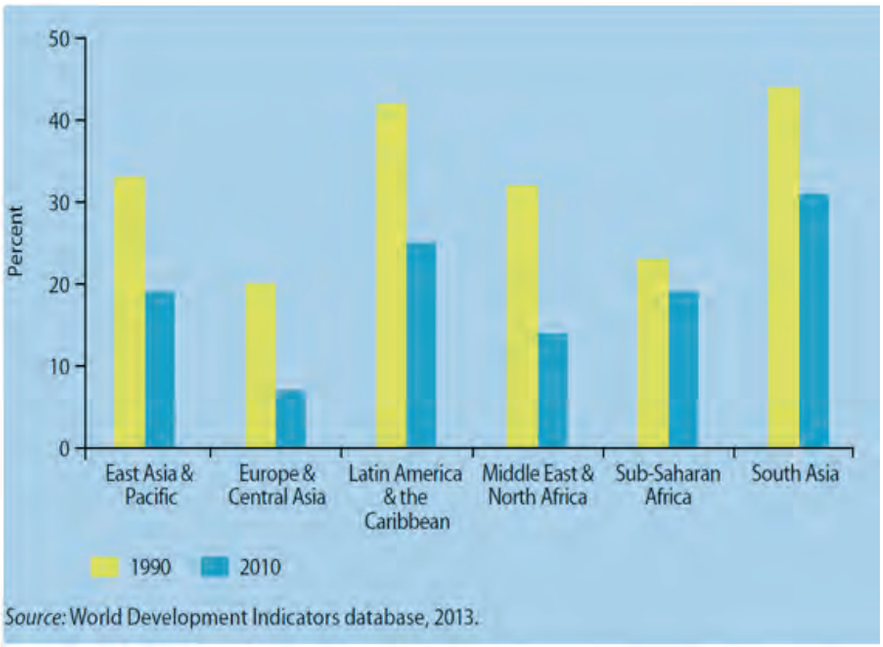
children, older persons and those with disabilities. This would contribute directly to achieving the goals of poverty eradication (SDG 1), ensuring healthcare (SDG 3) and providing access to quality education (SDG 4). Furthermore, it would lead to reduction of non-communicable diseases (SDG 3) by encouraging cycling, walking and community interactions.[2] Additionally, an improved transport system would bring down the number of accidental deaths and injuries.

The importance of SDG 11 cannot be over emphasised in the context of limited success in meeting the MDG 7. The main reason for the latter is setting no quantitative targets for various monitoring indicators such as the proportion of land area to be kept vacant or brought under forestry, water resources and marine areas to be protected, CO_2 emission, household's access to water sanitation, etc., at the national level. Most countries, however, pursued the target 7D, of improving the conditions in the slums in an attempt to 'sanitise' the cities quite vigorously. However, engagement of private actors in their strategy resulted in rise in the value of land, leading to dislocation of slum dwellers and their replacement by middle class households, who could afford the enhanced prices. This led to a process of exclusion whereby the growth rate of urban population turned out to be significantly below what was projected by the UN before a decade.

Currently, more than half of humanity – 3.5 billion people – lives in urban areas. By 2030, almost two-thirds of the global population will be urban. In 1990, there were ten mega-cities with more than 10 million inhabitants. In 2015, there are 28 mega-cities, home to a total of 453 million people. The importance of SDG 11 cannot be exaggerated in view of the concentration of urban population in a handful of large cites, particularly in South Asian countries, necessitating vertical growth on limited urban space and the cities drawing in water and other resources from distant hinterland. This has resulted in just 3 per cent of the urban land accounting for 60-80 per cent of energy consumption and 75 per cent of carbon emissions many of the South Asian countries.

Furthermore, the gaps between rural and urban areas in their per capita income, quality of employment, and access to basic amenities are very high globally. These turn out to be the highest in South Asian region.

Figure 1: Urban Rural Gap in Percentage of Households having Access to Sanitation

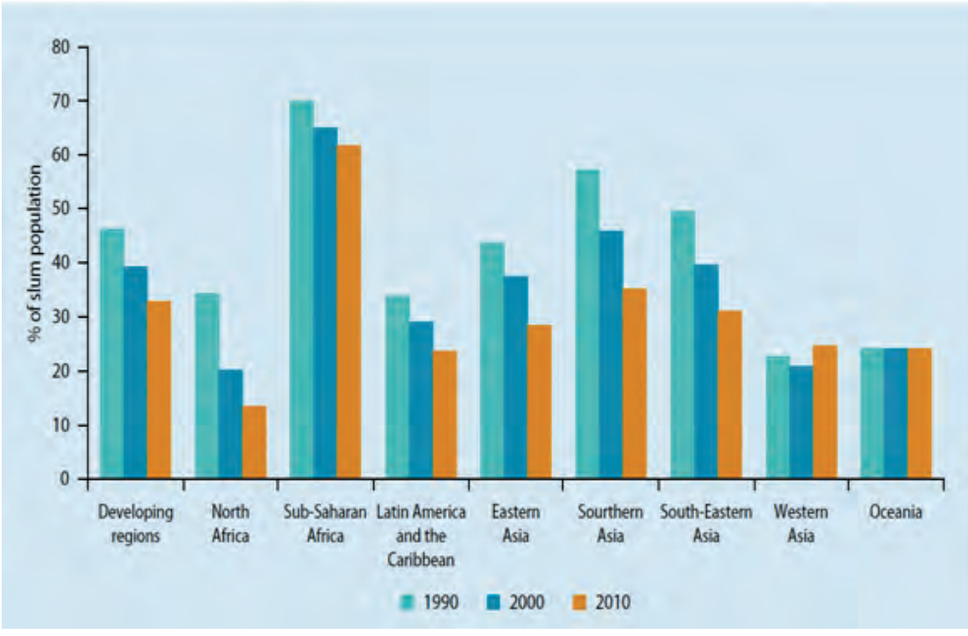


Source: World Development Indicators database, 2013.

The gap in terms of households having sanitation facilities (Figure 1) was as high as 44 per cent against that of 42 per cent in Latin America and Caribbean in 1990. The gap has gone down dramatically in the latter in 2010 but not in South Asia. Importantly, the percentage of slum population has declined significantly at the global level, this being hailed as a big success of the MDG 7. The reduction is the highest in case of South Asia (Figure 2). India is at the forefront in confirming this success story as the slum dwelling population which was projected to go up from 63 million to 93 million during 2001-11 was estimated to be 65 million only, recording a decline in the share of slum population in urban areas from 24.4 per cent to 17.2 per cent. It is curious that the limited success in improving the drinking water facility, extremely tardy progress in extending sanitation system (Target 7C) and the concomitant Rural Urban inequality have not received due policy concern. The key factor behind the grossly inadequate outcome for most of the indicators under MDG 7 is that the targets were not supported by a clear roadmap towards sustainability, at global or national level. Consequently, these were not brought into active policy domain of the national and state governments.

Doubts have been raised whether the world is ready to adopt the SDGs as there are serious issues in integrating sustainable development targets with those of inclusivity within current priorities of development in different countries. For making these into reality, the cities need to forge new local and regional partnerships, a different paradigm of engagement with the market and a new system of governance. They can play a critical role in successful implementation of SDG 11 through establishment of an interactive system of exchange of indicators and monitoring by an apex agency. The key concern here will be whether the cities are able to economically absorb the persons displaced from primary sector in a meaningful manner and provide them access to employment and basic amenities. Unfortunately, the goal does not specify any target relating to inclusivity of cities nor indicate how this is to be achieved through intervention in urban production system and labour market. Some detailing out of the targets of inclusivity at global and national level is an imperative for achieving success in this domain.

Figure 2: Proportion of Urban Population Living in Slums 1990-2010



A Strategy towards Meeting the SDG 11 and Making the Cities Inclusive and Resilient in India

The level of urbanisation and the growth rate of urban population in India has at best been modest since Independence, in a sharp contrast with the projections made by UN system.[3] The rate of (annual exponential) urban growth was reasonably high in the 1950s at 3.3 per cent, fell sharply during the 1960s to 2.2 per cent but reached its peak at 3.8 per cent in the 1970s, as reported by Population Census in India. These rates were similar or lower than those of Africa or Latin America throughout the period. However, there has been a slump during 1980s and 1990s, the rate for India coming down to 3.1 per cent and 2.7 per cent. This rate could be maintained at 2.7 per cent during 2001-11, simply because of identification of 2800 new urban centres, attribute partly to Census activism. The sluggish growth of urban population in India has been responsible for the delay in matching the milestone of the world population becoming half urban, by at least 3 years.

The global projections are that 95 per cent of urban expansion in the coming two decades will take place in the developing world. The epicenter of urbanisation is expected to shift from Latin America to Asia. India is predicted to be 'hit by urban avalanche', the number of urban dwellers doubling over the next 35 years. Shift of labour force from primary sector to more productive manufacturing and tertiary activities in urban areas, having high density of population and economic activities, would bring efficiency gains and sustain a higher rate of economic growth, as predicted by the most international organisations. While forestation programmes, reduction in the use of fossil fuel based energy and technological innovations would reduce resource and energy intensity per unit of GDP, as committed by India in terms of its INDC (Intended Nationally Determined Contribution), rapid urbanisation and its top heavy character is likely to exert pressure on agricultural land, ground water resources, quality of air, etc., in and around large cities and development corridors.

The prediction of urban explosion by global and regional development cum banking agencies have, however, proved to be fallacious. There has been a significant deceleration in demographic growth of the large cities in recent years. Many of these have turned out to be exclusionary in character and gone into 'a sanitisation drive' through eviction of slums and restriction on growth of informal activities. Their demographic growth rates have declined at a faster rate than what can be attributed to fertility decline. The fall in the overall growth rate of urban population can, thus, largely be attributed to the top heaviness in urban structure in the country. Since over 25 per cent of the total urban population are accounted for by cities with population over 5 million, deceleration in their demographic growth, would bring down the overall rate of urbanisation. The increase in the share of 5-million and million plus cities has, thus, been stalled in the last Census decade.

The challenge and responsibilities of achieving the SDG 11 are imperative in India. Urbanisation must usher in a process of inclusive economic growth and counter the trends in rural-urban and intra-urban inequality that have grown at an alarming rate. It has to ensure that the all sections of population, including women, children, SC/ST population and religious minorities have access to safe and affordable housing, basic amenities and open green space. It would involve slum up-gradation, improvement of urban planning and management practices in a way that is both participatory and inclusive, besides safeguarding the heritage and protecting the citizenry against natural disasters.

Research studies and available information on the economic costs of providing infrastructure and basic services suggest that the per capita costs work out to be six to seven times in class I cities, compared to that in small and medium towns. The ratio works out to be much higher when the environmental costs are brought into the calculation. The emphasis, therefore, must be on 'distributed urbanisation' in the country, focussing on growth of a large number of small and medium towns that can serve their rural hinterland, as stipulated by the Planning Commission in the 12th Five Year Plan. Consequently, the changes in the size class distribution of urban population, brought about through spatial strategy of development, will determine whether India can bring down the consumption of energy and other natural resources, in support of its claim of meeting the SDG 11 and moving towards a sustainable path of development in a time bound manner.

India has time and again underlined the need for climate justice and has argued that although it was not part of the problem of Climate Change, it is willing to be part of the solution. After declaring that the response of developed countries has been "tepid and inadequate" resulting in an "emission ambition gap", it has announced its INDCs, stipulating reduction in carbon emissions relative to its GDP by 35 per cent by 2030 from the levels of 2005. This may be seen as a mere extrapolation of an earlier commitment, to reduce its emission intensity by 25 per cent by 2020 from its 2005 levels. The government seems to have avoided making a commitment to a cut in absolute quantum of emissions though the US, EU, China and Brazil have done so. These INDCs envisage a number of new initiatives and priority areas like transport system, building design, appliances and waste management. The national and international expert bodies, however, hold that India can reduce its emission intensity by up to 40 per cent simply through forestation programme and shifting to alternate mode of energy production. It can thus set an example by overshooting the target by a margin.

The second important INDC declaration is that 40 per cent of the country's electricity would be based on non-fossil fuel, such as wind and solar power, by 2030. Understandably, there will be substantial reduction in thermal power and increase in nuclear energy generation. Thirdly, the government has chalked up an ambitious blueprint for a carbon sink plan and has made significant progress towards forestation. The environment ministry has issued guidelines to hand degraded forests over to the private sector to grow timber and other forest products. The proposed conversion of natural forests into monoculture plantations, however, is likely to result in loss of habitat and biodiversity.

All these measures would mean serious financial commitment on the part of the government since it is unreasonable to expect much by way of international climate finance. An expenditure of over 2.5 trillion dollars is likely to be incurred between 2015 and 2030 to carry out intended climate actions. Adaptation in the energy sector alone could cost more than 70 billion dollars. India's annual economic cost from climate change linked measures could be 1.8 per cent of the gross domestic product by 2050. While all these expenditures are likely to become mandatory under international pressure, there is no going back for India from its aggressive path of technological transformation. Thankfully, the missions of Smart Cities, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Housing for All by 2020, Swatch Bharat Mission (Massive sanitation drive), are largely in line with the targets set under SDG 11. However, many of the components of these missions, implemented through private sector participation, are likely to bring high tech solutions and make the cities unaffordable to the poor. Also, this may not go well with the proposed shift to renewable sources of energy. Massive forestation programmes may also conflict with the development of industrial corridors and Make in India mission that are linked with infrastructural provision in cluster of villages under the Rurban programme. The economic success of these programmes would depend on the global and national competitiveness of the industries which may push for frontier technologies, mostly unsuited for infrastructure development in backward areas. Finally, studies focussed on technological options suggest that there is saturation of manufacturing efficiency in several industries, implying that manufacturing growth here can occur only at the cost of higher level of emissions.

Proposing a Framework to Develop Indicators for Monitoring and Launching Corrective Actions

Designing a system of incentives and penalties for effective implementation of the current missions and programmes would involve determining a set of parameters reflecting energy efficiency, emissions of pollutants and climatic vulnerability on the one hand and those articulating inclusivity, spatial balance in development etc., on the other. A number of UN, governmental and non-governmental agencies have proposed vulnerability indices taking all the physiographic and socio-economic factors into consideration within the framework of inclusive development. It would be important to build up these indices, with appropriate modification specific to Indian situation at the city level.

For implementing and monitoring development projects, it would be necessary to build a transparent and unambiguous system of indicators and link these to incentives and penalties. These should reflect the status

of ecological vulnerability, efforts made to improve sustainability as also inclusiveness. These would constitute the basis for sanctioning of the grants and getting exemptions from emission compliance norms, set at national level. These are to be updated at regular intervals as technical knowledge regarding the costs, benefits and resilience advances over time.

The success of the approach would depend on creation of green funds under every central government programme, implemented at the city level. An institution with a multi-disciplinary expert body would have to be established at national level entrusted with the responsibility to formalise the methodology for working out the indices.[4] Apportionment of green funds across the cities would have to be done based on the recommendations of this institution.

The impact of a development programme on the local environment would vary across regions and cities not only because of their varying physiological features but also the socio-economic characteristics of the population. The ecological vulnerability and inclusivity indices, therefore, must be sensitive to the changes occurring in the cities. These indicators can be built from the existing national systems that provide information at settlement level. Choice of indicators and temporal and cross sectional comparability are the major issues here. Specific indicators need to be designed to capture the specific vulnerability of the cities located in coastal areas or in climate zones of heavy rainfall, high temperature variation etc.

Sources collecting exclusively biophysical data to identify regional hotspots can provide only limited inputs in estimating the levels of coastal protection. However, information from the Population Census, National Sample Survey etc. would be useful in proposing a number of anthropogenic indicators. Vulnerability and inclusivity would, thus, be determined through aggregation of these two sets of indicators. Building some kind of regional consensus on the choice of indicators and method of composition would be important for classifying the cities into categories and determining fair allocations from the green fund assistance. The final decision regarding the selection of appropriate indicators should be made by the apex institution in a manner so as to give weightage to regional specificities.

Any attempt at constructing such summary statistics involves resolving legitimate political or normative issues. It is important to note that designing resilience indices is as much a socio-political as a scientific task. Changes in the thrust areas of resilience would produce different rankings of the cities and suggest different strategies. However, instead of determining ranking and fund allocation through political bargaining, attempts must be made to institutionalise the process of exercising political judgment through a formal methodology for constructing the indices.

The proposition that the cities that are most vulnerable to climate change should receive priority assistance, irrespective of their scale of adaptation/ resilience measures, computed within a human development framework, would be contested, on the ground that this would make the recipient cities complacent with regard to fund availability. The format of city challenge competition, as adopted in selecting the smart cities, would be appropriate in this context as well. It is possible to work out an aggregative index by incorporating aspects of vulnerability, initiatives towards achieving sustainability and inclusivity. However, bringing all these considerations into a single index would blunt the focus and restrict its usability in policy making. Vulnerability index would reflect the present state of environment with regard to resource base, quality of air and water, etc., while the resilience strategy index would articulate the efforts made at the city level for addressing the problems. The inclusivity index, constructed separately, must reflect the measures undertaken to open up the city and its economy to migrants and socio-economic groups.

A case, thus, can be made to work out a number of disaggregated indices. The need for special indicators for residential, industrial and administrative cities must be recognised. The policy perspectives underlying these indicators and their usability in measuring and monitoring performance of different projects in terms of carbon efficiency and inclusivity need to brought into the public domain. The critical challenge would be to formalise the methodology and work out indicators of depreciation of natural assets and their costs within a framework for national green accounting. These must be generated at regular intervals to monitor the projects and work out the course of corrective action. A few among the developed countries are already building temporally comparable indicators at disaggregated level on an experimental basis. It is important that

India, at national level through a network of regional institutions, takes immediate steps in evolving the methodology for constructing and releasing a set of temporally and cross-sectionally comparable indicators at a spatially disaggregated manner and employ these in monitoring the projects.

Endnotes

1 Asia-Pacific Regional MDGs Report 2014-15, Making it Happen: Technology, Finance and Statistics for Sustainable Development in Asia and the Pacific

2 Kristie Daniel is Program Director, Livable Cities Program, HealthBridge Foundation of Canada, Ottawa.

3 The UN projections are based on modified exponential models that stipulate that urban rural growth differential will increase till a country reaches 50 per cent level of urbanisation.

4 A similar system has been proposed by various UN agencies at the global level United Nations (2008).

Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable: Targets and Indicators	
11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums	11.1.1 Proportion of urban population living in slums, informal settlements or inadequate housing
11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons	11.2.1 Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities
11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries	11.3.1 Ratio of land consumption rate to population growth rate 11.3.2 Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically
11.4 Strengthen efforts to protect and safeguard the world's cultural and natural heritage	11.4.1 Total expenditure (public and private) per capita spent on the preservation, protection and conservation of all cultural and natural heritage, by type of heritage (cultural, natural, mixed and World Heritage Centre designation), level of government (national, regional and local/municipal), type of expenditure (operating expenditure/investment) and type of private funding (donations in kind, private non-profit sector and sponsorship)
11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations	11.5.1 Number of deaths, missing persons and persons affected by disaster per 100,000 people*a* 11.5.2 Direct disaster economic loss in relation to global GDP, including disaster damage to critical infrastructure and disruption of basic services*a*
11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities 11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)
11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities	11.7.1 Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities 11.7.2 Proportion of persons victim of physical or sexual harassment, by sex, age, disability status and place of occurrence, in the previous 12 months
11.a Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning	11.a.1 Proportion of population living in cities that implement urban and regional development plans integrating population projections and resource needs, by size of city
11.b By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels	11.b.1 Proportion of local governments that adopt and implement local disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015-2030a 11.b.2 Number of countries with national and local disaster risk reduction strategiesa
11.c Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials	11.c.1 Proportion of financial support to the least developed countries that is allocated to the construction and retrofitting of sustainable, resilient and resource-efficient buildings utilizing local materials

12
Sustainable Consumption and Production

Introduction

The importance of sustainable consumption and production (SCP) has long been recognised in global discourse, yet the Millennium Development Goals (MDGs) did not address this key objective of achieving SCP patterns. The High-Level Panel of Eminent Persons on the Post-2015 Development Agenda specifically noted the omission. Many governments in the Open Working Group on Sustainable Development Goals (SDGs) recognised that this objective should be embedded in the SDGs, either as a stand-alone goal, or cutting across other goals on food, health, economic growth, industrialisation, cities and ecosystems.

Chapter 4 of Agenda 21, endorsed by the United Nations Conference on Economic Development (UNCED) in Rio de Janeiro in 1992, identified unsustainable consumption and production patterns, particularly in industrialised countries, as the major cause behind the continued deterioration of the global environment. Agenda 21 stresses that changes in consumption and production patterns are necessary to ensure more sustainable development. The concept of SCP was also recognised in the Johannesburg Plan of Implementation adopted in 2002 at the World Summit on Sustainable Development (WSSD).

The following year in 2003, the Marrakesh Process was initiated to respond to the specific call of the Plan of Implementation to develop of a 10-year framework of SCP programmes.[1] In 2012, the United Nations Conference on Sustainable Development (Rio+20) reaffirmed that fundamental changes in the way societies consume and produce are indispensable for achieving global sustainable development (UNGA Resolution 66/288, p.4).

Eventually, sustainable consumption and production has been included as a stand-alone SDG as the goal 12 reads – Ensure sustainable consumption and production patterns. The goal 12, however, has strong linkages with other goals – several themes that are of relevance under Goal 12 are also of interest to other goals. For example, SCP can contribute to social goals or poverty reduction without an increase in the global use of resources, materials and chemicals and, thereby, sustain this progress over time. There are thus linkages with Goals 7, 8 and 13 on sustainable growth, energy and climate change. Another linkage is that in the context of efficiency of water use which is dealt under Goal 6 as well (ensure availability and sustainable management of water[2] and sanitation for all).

The Conceptual Framework

Sustainable consumption and production (SCP) promotes social and economic development within the carrying capacity of ecosystems, raises efficiency and ensures sustainability in the use of resources and production processes, reducing resource degradation, pollution and waste. Sustainable consumption addresses the demand side, focussing on consumers' choices of goods and services such as food, shelter, clothing, mobility and leisure, to fulfil basic needs and improve the quality of life (UNEP, 2006). It means buying goods and services that do not harm the environment, society, and the economy. However, it is important to understand that sustainable consumption is not necessarily about consuming less; it is about consuming better, i.e. more efficiently, with less risk to our health and environment.

Sustainable production concerns the supply side, focussing on the economic, social and environmental impacts of production processes. The focus is on achieving more resource efficient and cleaner production, which aims at reducing the risks to humans and the environment. Producing sustainably refers to optimising the use of natural resources such as raw materials, energy, and water at all stages of the production cycle, thus reducing the ecological footprint of products. More resource efficient production practices allow consumers to meet more of their needs (therefore, consume more) by using the same amount or even less resources. At the core of the SCP concept is the lifecycle approach which requires that at each stage of a product's lifecycle, due consideration is given to alternatives which improve the system, and ensures that there is no burden shifting between different stages of product life cycle.

Countries need to either reduce their footprint, or might increase it only to the extent that they remain within global and regional bio-capacities (Kitzes *et al.*, 2008). The changes in consumption and production patterns must be led by the developed world where per capita consumption is high and that has particular responsibility in sharing SCP-related technologies (High-Level Panel of Eminent Persons on the Post-2015 Development Agenda (HLP), 2013). Sustainable consumption can be promoted through a mix of policy, economic and voluntary instruments, including formal and informal education.

The Targets and Potential Indicators

This section briefly discusses the philosophy behind each of the targets and the technical architecture for monitoring them and suggests some potential indicators. The goal on SCP has eleven targets linked to it, progress against which will need to be monitored by defining indicators. This paper focuses on the aspects of the targets which are not already included elsewhere such as under agriculture, transport, and energy.

12.1 Implement the 10-Year framework of programmes on sustainable consumption and production (10YFP), all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries

This is more of an implementation framework rather than a target and actually covers all other targets. The primary objectives of the 10 YFP are to:

- Support regional and national policies and initiatives to accelerate the shift towards SCP, contributing to resource efficiency and decoupling economic growth from environmental degradation and resource use, while creating new job/market opportunities and contributing to poverty eradication and social development.
- Mainstream SCP into sustainable development policies, programmes and strategies, as appropriate, including into poverty reduction strategies.
- Enable all stakeholders to share information and knowledge on SCP tools, initiatives and best practices, raising awareness and enhancing cooperation and development of new partnerships – including public-private partnerships.

The 10 YFP includes an initial list of five programmes to be developed under the Framework, as well as a mechanism to further develop and expand this list over time to include other programme areas. The initial list includes: consumer information, sustainable lifestyles and education, sustainable public procurement, sustainable buildings and construction and sustainable tourism, including ecotourism.

Since this is not a pure target, the indictors for this target need not be outcome oriented. Rather, in this context, it will be important to see if there are frameworks, policies and actions in place. Nevertheless, an effort can be made to make it more specific and measurable by looking at the public expenditure on programmes in each of these areas as percentage of GDP or government expenditure.

Sustainable Land and Water Use: This will look at whether India has a comprehensive framework to deal with these issues. Since, state governments have a major role to play in this regard, comprehensiveness will require that all the state governments also have such frameworks in place.

Renewable Energy Development Policies/Actions: This will include promotional and regulatory policies for renewable energy including incentive schemes and subsidies and support for research and development. In this area also, state governments will have an important

role to play and hence their policies on feed in tariffs, net metering etc. will be part of the considerations.

Sustainability or Green Parameters in Public Procurement Policy: Governments and its agencies are the biggest consumers in any economy. Hence if government consumption becomes sustainable and if it demands sustainable production process from its suppliers, an economy can make a major breakthrough towards sustainable consumption and production.

Standards, Certification and Eco-labelling: If consumers want to adopt sustainable consumption habits, they will require information about the production process through which the goods that they are consuming have been produced, and they also require information about the performance of the products. Such information can be made available to them through standards, certification and labelling.

Policies and rules on recycling: There is no comprehensive recycling policy in India but it is primarily driven by economic considerations. However, in recent years, recycling has become a part of policy framework in some sectors. This indicator can look at coverage of sectors in recycling policy.

Policies and Rules to Limit or Ban Use of Hazardous Materials: Consumer use many products in their day to day life which include hazardous materials like lead, mercury and other CBRN (chemical, biological, radiological and nuclear) materials. Some countries have either banned or limited use of such materials in some relevant products through standard setting. This indictor will see if the country has such policies and their coverage of sectors/products.

Building Code and Policies: These are used for promoting materials and energy efficiency in construction activities.

Multilateral Environment Agreements (MEAs): It will be useful to prepare a list of inventories of MEAs that are relevant for the country and see how many of them have been signed and ratified by this country. This will include agreements on hazardous chemicals and waste such as the Basel, Rotterdam, Stockholm and Minamata conventions, the ILO Chemicals Conventions and the International Health Regulations. This will also include agreements like Montreal, Kyoto and Cartagena protocols and Convention on Biological Diversity, the UN Convention to Combat Desertification, etc.

12.2. By 2030 achieve sustainable management and efficient use of natural resources

Natural resources are fundamental for any economy or society. They provide raw materials, energy, food, water and land, as well as environmental and social services.

The High-Level Panel of Eminent Persons on the Post-2015 Development Agenda (HLP) has specifically noted that the poor directly depend on natural resources, for food, fuel, medicine, shelter and livelihoods, and are especially affected by resource depletion and environmental degradation (United Nations, 2013). Thus there is growing recognition that the natural resource base of economic growth and human well-being has to be managed more effectively and efficiently to secure future prosperity and well-being on this planet (UNEP, 2014). India is committed to the efficient and sustainable use of resources. Resource use efficiency is one of the stated objectives of India's National Environment Policy. The need to improve energy efficiency across the energy chain is one of the guiding premises of India's Integrated Energy Policy.[3] One of the eight national missions under the National Action Plan on Climate Change deals directly with the issue (National Mission for Enhanced Energy Efficiency) while several other missions refer to the need to enhance resource use efficiency (e.g. National Water Mission, National Mission for Sustainable Agriculture). Resource-specific strategies and policies such as the National Water Policy 2012 also highlight the imperative for enhanced efficiency.

Ideally, an indicator of efficient resource use should take account of all resources including fossil fuels, biomass (e.g. agricultural, timber, marine resources) and minerals that are used in the economy. However, there is insufficient information to give an integrated view of how minerals, metals, energy, timber or water flow through the economy. In recent years, several efforts have been made to develop the methodologies for material flow analysis (MFA) and the number of practical applications is growing. Countries are, however, at a variety of stages in developing and using MFA (OECD, 2008).

Most available indicators emphasize efficiency considerations with little or no attention to the need

of maintaining a critical stock of natural resources. While efficiency measures might suggest progress in the right direction, they frequently do not indicate when a natural or ecological threshold may be crossed, undermining long-term sustainability (UNEP, 2008). Thus, we need to find the appropriate balance between "critical stock" indicators on absolute environmental limits) and relative performance-based efficiency indictors.

UNEP (2008) reviews SCP indicators used by international agencies, developed countries (OECD and European Commission) as well as 20 developing countries. From this review, we list below the main indicators that are of relevance for India. We exclude from this review indicators of land, forests, and biodiversity, which are the topic of Goal 15, and water which is dealt with specifically under Goal 6.

- Material intensity of consumption (tonnes per capita)
- Material intensity of GDP (PPP)
- Energy consumption per capita
- Energy intensity of GDP (PPP)
- Depletion rate of minerals and non-renewable resources
- Alternative indices such as the Ecological Footprint and the Inclusive Wealth Index

12.3 By 2030 halve per capita global food waste at the retail and consumer-level, and reduce food losses along production and supply chains including post-harvest losses

FAO estimates that each year, one-third of all food produced for human consumption is lost or wasted – around 1.3 billion tonnes. Food losses and waste can occur at various stages from the production of food to its handling and storage, processing and packaging, distribution and marketing right up to its consumption. Thus, ideally we would need indicators to quantify wastage at each of these stages. However, studies suggest that in the case of developing countries, most food loss takes place in post-production, harvesting, transportation and storage, and is primarily related to financial and structural limitations in harvest techniques, storage and transport infrastructures, combined with climatic conditions favourable to food spoilage. On the other hand, food waste is largely a problem in the marketing and consumption stages in more developed countries (Gustavsson *et al.*, 2011).

Containing food loss is obviously an important issue for India in view of the number of malnourished children and the prevalence of hunger in the country. In India, while people take care not to waste food at homes, but in social gatherings (like marriages, meetings, parties, etc.) substantial food is wasted. A study by IIPA (2011) estimated that 15-25 per cent of food is wasted in such gatherings. Addressing post-harvest loss however has its own challenges. This will need significant investment in supply chain and storage capacities which will also make the system more energy intensive. We are not sure what the net result will be as the gains from reduction of wastage might be offset by the higher level of consumption of energy and the material consumption that will be accompanied with the huge investment in the supply chain system.

Moreover, the cost of measuring losses and waste by tracking quantities of a commodity from production through different stages of the value chain and distribution to final consumption could be challenging both methodologically and cost-wise.

National Programme for LED-based Home and Street Lighting in India

Light Emitting Diode (LED) bulbs are 10 times more energy efficient compared to ordinary incandescent light bulbs and consumes about half the energy compared to compact fluorescents lamps (CFLs) per unit of light generated (lumens). LED bulbs also have a very long life, almost 50 times more than ordinary bulbs, and 8-10 times that of CFLs, and therefore provide both energy and cost savings in the medium-term. However, consumers do not go for LED bulbs due to high upfront cost. To overcome this problem, the Government of India launched a National Programme for LED-based Home and Street Lighting in January 2015. Under the programme, as scheme was launched in Delhi where LED bulbs will be provided to all domestic consumers at an initial payment of Rs. 10 each and recovery of Rs. 10 each for 12 months from their electricity bill. Hence, the cost for an LED bulb to domestic consumer will be Rs 130 through this programme due to bulk procurement, compared to the current open market retail price in the range of Rs. 350-600 for LED bulbs.

12.4 By 2020 achieve environmentally sound management of chemicals and all wastes throughout their life cycle in accordance with agreed international frameworks and significantly reduce their release to air, water and soil to minimise their adverse impacts on human health and the environment

Many industrial areas have seen gross chemical contamination, with grave damage to human health, genetic structures and reproductive outcomes and the environment. India has been among the worst victims of an accident involving hazardous chemicals. The Bhopal disaster is the world's worst industrial catastrophe. It occurred on the night of December 2–3, 1984 at the Union Carbide India Limited (UCIL) pesticide plant. A leak of methyl isocyanate gas and other chemicals, according to government, caused 558,125 injuries including 38,478 temporary partial and approximately 3,900 severely and permanently disabling injuries and the estimated death was 15,000.[4] Since it involved a foreign company, India found it difficult to ensure justice and adequate compensation to the victims. India was thus quite serious in dealing with the issue of safe handling of hazardous materials. The three major conventions, namely, the Basel, Rotterdam and Stockholm Conventions all came after the Bhopal disaster, and hence India played an active role in developing them.

About 4.4 million tonnes of hazardous wastes are being generated by 13011 units spread over 373 districts of the country (This data is based on the waste categories indicated in the Hazardous Wastes (Management and Handling) Rules, 1989 and is likely to be revised in view of the amendments of 2000). The states of Maharashtra, Gujarat and Tamil Nadu account for over 63 per cent of the total hazardous wastes generated in the country.

The Hazardous Substances Management Division (HSMD) is the nodal point within the Ministry of Environment, Forests and Climate Change (MoEFCC), for management of chemical emergencies and hazardous substances. The Division is also the nodal point for the three International Conventions mentioned above. The Manufacture, Storage and Import of Hazardous Chemical (MSIHC) Rules, 1989/2000 and the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 are the main instruments for ensuring chemical safety in the country. Currently, there are 1464 Major Accident Hazard Units (MAH) in India. A comprehensive National Chemical Profile assessing the existing institutional, administrative, technical and legal infrastructure vis-a-vis the requirements of safe handling of chemicals is being prepared.

India is actively involved in the work relating to preparation of technical guidelines for environmentally sound management of ship-breaking along with Norway and the Netherlands under the Basel Convention. As far as Rotterdam Convention is concerned, India is fully compliant with its commitments. India is also a party to the Stockholm Convention on Persistent Organic Pollutants (POPs). The Convention seeks to eliminate production, use, import and export of 12 identified POPs. A Preliminary Enabling Activity Project to prepare National Implementation Plan (NIP) for POPs has been assigned to Industrial Toxicology Research Centre (ITRC), Lucknow in association with United Nations Industrial Development Organisation (UNIDO) under Global Environment Facility (GEF) assistance.

In the first part of the target, the indicators can be derived from the Basel, Rotterdam and Stockholm Conventions. The indicators, at the first level, can look at the national implementation plan of the Conventions and incorporate specific commitments and their coverage in relation the hazardous chemicals listed under the three Conventions.

At the second, level, indicators can include data on these chemicals that are released in the environment. It is understood that data might not be available for all different types of chemicals but a subset of them can be included. At another level, it will look at the quantity of different types of waste generated on a per capita basis.

MoEFCC has developed two important web-based information systems. National Hazardous Waste Information System (NHWIS) which gives the status of Hazardous Waste Management in the country. Chemical Accident Information Reporting System (CAIRS) storing, retrieving and analysing data in visual form for all the information related to the chemical accidents happening in India. These will be useful in measuring the indicators.

12.5 By 2030, Substantially Reduce Waste Generation through Prevention, Reduction, Recycling, and Reuse

Wastes are inevitable by-products of consumption and production processes. Sound management of waste is necessary to avoid substantial adverse human health

and environmental effects. Despite achievements in waste recycling, amounts of solid waste going to final disposal are on the increase as are overall trends in waste generation. The Indian Government has enacted laws to regulate many kinds of waste generated in the country. The wide range of wastes include household/ municipal waste, biomedical waste, e-waste, waste electronic and electrical equipment, waste from construction and demolition activities, waste from end of life cars, mining waste, waste from power plants, hazardous waste, waste from agriculture/forestry etc. The Environment Protection Act (EPA), 1986 is the umbrella Act that pertains to management of solid waste in the country. The National Environment Policy (NEP), 2006 of the Government of India emphasises the need for recovery and reuse of any material thereby reducing the waste destined for final disposal. The rules made under the EPA that would govern the management of all kinds of waste in India include:

- Management and Handling of Municipal Solid Waste (2000),
- Management and Handling of Bio-Medical Waste (1998, amendment 2003),
- Management and Handling of Hazardous Waste (1989, amended in 2000 and 2003),
- Recycled Plastics Manufacture and Usage Rules (1999),
- Notifications for the disposal of fly ash,
- Management and Handling of batteries, 2001, and
- E-Waste (Management and Handling) Rules, 2011.

Indicators could relate to the total amount of waste produced by sources including domestic, industrial and nuclear waste. Intensities are also used to show the amount of waste produced per capita and per unit of GDP (PPP). In the context of recycling indicators could apply to paper, glass, electronics, although they can and should be adopted for many other resources. The following can be considered:

- Municipal solid waste generation (volumes or mass) per capita and per year,
- Percentage of city population with regular solid waste collection (residential),
- Percentage of solid waste that is well managed to adequate final disposal (recycled, reused, composted, deposited in landfills, incineration sites, etc.),
- Recycling rate (Percentage of a city's solid waste that is recycled), and
- Percentage of the city's solid waste that is disposed of in a sanitary landfill.

12.6 Encourage companies, especially large and trans-national companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle

The objective of sustainable production cannot be achieved without companies playing the leading role. India is one of the first countries in the world to mandate responsible business practices. The Securities and Exchange Board of India (SEBI) from November 2011 mandates the 100 largest listed entities must submit Business Responsibility Reports, as a part of their annual reports. This happened as a cascading effect of the launch of the National Voluntary Guidelines on Social, Environmental and Economic Responsibilities of Business on 8 July 2011 by the Ministry of Corporate Affairs, Government of India. The new Companies Act, effective from 1 April 2014, has many new provisions, the most important being, liability of profit-making companies to spend a certain percentage of their profits on activities under Corporate Social Responsibility (CSR) as enumerated in Section 135 of the Act.

Sustainability reporting helps organisations set goals, measure performance, and manage change in order to make their operations more sustainable. Many companies and international organisations, such as the International Organisation for Standardisation and the Global Reporting Initiatives, have developed a set of indicators to measure progress of environmental performance and sustainable business. In India, companies have been reporting on sustainability since 2001 by using the GRI Framework, following the Carbon Disclosure Project (CDP) or completing the UN Global Compact's Communication of Progress (CoP). However, a small number of companies report under all these reporting norms. The indicator for this target could be quite straight forward. The big companies could be defined with an appropriate threshold level and it can be seen what proportion of them are reporting sustainability information.

12.7 Promote public procurement practices that are sustainable in accordance with national policies and priorities

Sustainable Procurement is a process whereby organisations (public or private) procure goods and

PET Bottle Recovery and Recycling in Mauritius

The Ministry of Environment and Sustainable Development of Mauritiuss promulgated the Environment Protection (PET bottle permit) Regulations in 2001. In line with these regulations, bottling companies must encourage the return of used PET bottles and set up a collecting/compacting system so that the used PET bottles can be recycled and/or exported. In response to these regulations, the three big soft drinks producers, namely, Phoenix Camp Mineral (PCM), Quality Beverages Limited (QBL) and Compagnie Industrielle de Pailles (CIP), have set up the Mauritius Bottlers' Association which contracts out the collection, process and recycling of PET bottles to a private company called Polypet Recyclers Ltd. This company is actually responsible for purchasing used PET bottles from individuals, NGOs, schools and other organisations. Used pet bottles are collected, baled and sorted out by batch according to their colour. The used pet bottles are washed, granulated, re-washed and dried in specially designed machines. They are then ground and fed into other machines which melt them under sweltering heat and pressure. The PET waste is finally processed into pellets for export to South Africa.

Source: *Sustainable Consumption and Production: Best Practices in Mauritius,* Ministry of Environment and Sustainable Development, Government of Mauritius and United Nations Environment Programme, 2013.

services in a manner that generates benefits to the organisation, society and economy, while ensuring that the environmental impact is minimal. On average, total public expenditures by central and local governments (including consumption and investment expenditures) are estimated to account for about 20 per cent of GDP in OECD countries, and roughly 15 per cent in non-OECD countries. Sustainable Procurement has a huge potential in India given that an estimated 20 per cent of the GDP per annum is spent on public procurement in India.

The main effort in the area of developing relevant indicators has been for the European Commission's Green Public Procurement programme. There are no universally accepted or widely used indicators of Sustainable Procurement, and one of the commonly proposed ones in the literature is[5, 6] :

- Share of labelled or otherwise classified sustainable goods and services at various levels of public procurement – municipal to national in monetary value and in terms of the number of contracts.

12.8 By 2030 ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature

Changing public understanding and attitudes are essential for the transition to SCP. Information and education can help create this understanding and attitude by raising awareness and thus leading to mass movements for recycling, renewable energy and other sustainable consumption practices. Specifically, awareness-raising in schools, and public information campaigns could play a big part in changing mind-sets by showing the advantages of moving towards lifestyles that are in harmony with the nature. The new forms of participation such as social media can enable governments, businesses, CSOs and academia to interact with, understand and respond to citizens' needs in new ways. However, it will be difficult to develop workable indicators. The following can be attempted:

- Awareness and know-how about sustainable development is integrated in curricula and has significantly increased.
- Presence of Labelling: For example, for energy efficiency of white goods, labelling of food products, labelling of pharma products should be essential for any products that contain hazardous substances.
- Sales volume of eco-labelled products.

12.a Support developing countries to strengthen their scientific and technological capacities to move towards more sustainable patterns of consumption and production

India is not expected to have any obligations on this but it is expected that, as a developing country, India should receive assistance from developed countries in developing its scientific and technological capabilities. This can have two parts: financial assistance and technological assistance. While measuring financial

assistance could be relatively easy, quantifying technological assistance is a difficult proposition. India might have acquired some of the technologies but this might have been purely through market mechanisms and the element of assistance may not be visible.

Another important aspect of the issue is that though India does not have any obligation to assist other countries, in practice, India is actually providing both financial and technical assistance to other developing countries. If this is included in the indicator, then India's performance can look very poor on this count as India's assistance to other countries is not substantial compared to the major donors.

12.b Develop and implement tools to monitor sustainable development impacts for sustainable tourism which creates jobs, promotes local culture and products

India recognises the importance of the tourism sector in the promotion of faster, sustainable and more inclusive economic growth. Recognising its role in promoting sustainable tourism, the Ministry of Tourism, Government of India, had, as far back as 1998, extensively deliberated with the industry and other stakeholders to formulate the "Ecotourism in India – Policy and Guidelines". The tourism sector's capability as a driver of sustainable and inclusive development, was renewed with the National Tourism Policy, 2002. The Ministry of Tourism has also framed Sustainable Tourism Criteria and indicators for India applicable to tour operators and the accommodation sector.

Organisations such as the World Tourist Organisation, the EU, and OECD as well as institutions and experts, have made efforts to create indicators of sustainable tourism. The World Tourist Organisation[7] and the Global Sustainable Tourism Council (GSTC) have come up with sustainable tourism criteria for tour operators, hotels and destinations.[8] However, these indicators are site specific. At the macro level, indicators on the number and type of eco-tourism facilities and the number of operators/ tourist facilities that are certified as sustainable may be more relevant. However, given the lack of relevant information on the sector and very low level of certification, developing effective indicators will be challenging.

12.c Rationalise inefficient fossil fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimising the possible adverse impacts on their development in a manner that protects the poor and the affected communities

Fossil-fuel subsidy reform can deliver on all three domains of sustainable development. They are costly and represent a deadweight loss to society because they artificially lower costs, which encourages inefficient allocation and use of resources and reducing them can create economic gains. Fossil-fuel subsidies create incentives for higher levels of consumption, which in turn produce more local and global pollutants. Additionally, fossil-fuel subsidies are often socially regressive as they typically benefit medium- to high-income households and lead to diversion of the targeted resources.

India has done away with petrol and diesel subsidies but they are still there for kerosene and LPG. In fact petrol is now highly taxed, while diesel is moderately taxed. On cost of production basis, there is no subsidy on coal but on international price basis it enjoys some subsidy. Electricity, which is generated mainly through coal is however subsidised in several states. Currently, on a net basis, there is no fossil fuel subsidy in India, but this can change in the event of international energy prices rising substantially (Nanda 2015).

Means of Implementation

Means of implementation would be more of generic issue rather than goal or target specific. The open working group proposal for sustainable development goals has given 19 targets under five heads, which are: finance, technology, trade, capacity building and systematic issues. There is increasing bent towards domestic resource mobilisation for the developing countries. Domestic reserves are more effective since financial inflow is stable and has strong linkages to taxation, accountability and broader state building goals (Strawson and Ifan, 2014).

On the other hand international aid is encouraged to be effective and low cost. According to Roodman (2014) aid must play a supportive and catalytic role, instead developed countries in an attempt to meet their ODA obligations have tended to overstretch Official Development Assistance (ODA) boundaries to include development loans charging interest near market rates, and export-promotion credits hugely paying for expatriate personnel offering "technical expertise". On a per capita basis, the amount of aid that India receives is quite low and it is unlikely to see a drastic rise and hence domestic resource will remain the mainstay. India has made it mandatory for companies to spend a portion of their profits on CSR and imposed a cess on coal. A part of the money involved can be used to promote the goal of SCP.

Fundamental to the issue of technology is its accessibility to the developing world. The intellectual property regime is a barrier towards technology transfer from the developed countries to developing countries (Cannady, 2009; UNCTAD, 2014; Schloss, 2013). Further, Cannady (2009) encourages mobilisation of intellectual capital that already exists in developing countries and encourages research and development within the developing world. UNCTAD argues that it is critical to translate technology transfer into local innovation that is economically relevant. It is also observed that technology from the developing world which is more adaptable and less costly is often overlooked in development assistance. It is encouraged therefore for South-South development cooperation to be considered for development assistance.

Central to international trade is market access. ITC (2010) established that poor countries cannot grow and reduce poverty without exports therefore market access and market entry is critical. There are concerns that standards can have a negative impact on equity and livelihoods if they are not designed carefully to integrate the views and concerns of the small producers and even to localise the standards to their understanding. There is also need to develop export capabilities in developing countries in terms of domestic supply capacity constraints, trade infrastructure and standards. Export performance is important for developing countries to raise finance on their own.

Core to the systematic issues is macro-economic stability. The financial crisis of 2008 affected developing countries including India by reducing foreign investment, demand for imports, and foreign remittances, as well as triggering capital outflows and instability. Proliferation of bilateral and regional trade and investment agreements that lead to shrinking of national policy space raises several concerns. While some agreements have imposed TRIPS-plus conditions on parties that reduce flexibilities and further reduce access to technologies, some have reduced their capability to regulate foreign capital that might be necessary to protect development interest. While protectionism might not be a good idea, developing countries often require adequate safeguard against trade induced deindustrialisation. The recent experience of Greece and some other European countries shows how dangerous shrinking of policy space could be for a country whether developed or developing. It will be important for India not to sign such trade agreements and thereby shrink its policy space.

Concluding Remarks

India does not have a comprehensive sustainable consumption policy or framework, though most of its elements are captured in several policies in different areas. Having an integrated policy or framework could be a good idea. Energy efficiency has been an important policy concern in India for several decades, but same cannot be true for other resources, particularly in case of water and mineral resources. While, per capita resource consumption is quite low, India must adopt measures to ensure delinking of its economic growth from resource consumption.

In India avoiding waste and recycling have been the cherished habits of people since ages. But things are changing gradually. For example, while farmers in eastern part of the country uses paddy straw as fodder and for other purposes, in north-western states like Punjab and Haryana, they are simply burnt down which is not only a wastage of bio-resources but also causes severe pollution. Awareness campaigns should be launched to ensure that people do not give up their good habits and do not adopt bad practices. There are several good examples in different parts of India which can be shared not only within India, but also outside. On the other hand, India can learn from other countries, particularly from the developing world.

The Government of India very recently launched programmes and campaigns like Clean India, Make in India and Smart Cities. Efforts should be made to leverage such programmes and campaigns to promote sustainable consumption and production by mainstreaming resource efficiency and sound management of wastes. While, finance and technology will have important roles to play, significant achievements can be made by awareness generation, education and promotion of good habits and practices.

Endnotes

1 The Marrakech Process, co-led by UN DESA and UNEP, is a global multi-stakeholder process to support the elaboration of a 10-Year Framework of Programmes (10YFP) on sustainable consumption and production.

2 It is important to make a distinction between water for drinking purposes and water for agriculture and industry and obviously water for direct human use must get priority.

3 See page 17 of India's Integrated Energy Policy. Available at: http://planningcommission.nic.in/reports/genrep/rep_intengy.pdf

4 Some non-government estimates put these figures at much higher levels.

5 http://seri.at/wp-content/uploads/2009/11/INDI-LINK_D-1.3.pdf

6 http://rru.worldbank.org/Public-Procurement/

7 http://sdt.unwto.org/sites/all/files/docpdf/croatia.pdf

8 GSTC has a diverse and membership including UN agencies, leading travel companies, hotels, country tourism boards, tour operators, individuals and communities. http://www.gstcouncil.org/about/learn-about-gstc.html

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Goal 12. Ensure Sustainable Consumption and Production Patterns: Targets and Indicators	
12.1 Implement the 10-Year Framework of Programmes on Sustainable Consumption and Production Patterns, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries	12.1.1 Number of countries with sustainable consumption and production (SCP) national action plans or SCP mainstreamed as a priority or a target into national policies
12.2 By 2030, achieve the sustainable management and efficient use of natural resources	12.2.1 Material footprint, material footprint per capita, and material footprint per GDP
	12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP
12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses	12.3.1 Global food loss index
12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment	12.4.1 Number of parties to international multilateral environmental agreements on hazardous waste, and other chemicals that meet their commitments and obligations in transmitting information as required by each relevant agreement
	12.4.2 Hazardous waste generated per capita and proportion of hazardous waste treated, by type of treatment
12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	12.5.1 National recycling rate, tons of material recycled
12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle	12.6.1 Number of companies publishing sustainability reports
12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities	12.7.1 Number of countries implementing sustainable public procurement policies and action plans
12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature	12.8.1 Extent to which (i) global citizenship education and (ii) education for sustainable development (including climate change education) are mainstreamed in (a) national education policies; (b) curricula; (c) teacher education; and (d) student assessment
12.a Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production	12.a.1 Amount of support to developing countries on research and development for sustainable consumption and production and environmentally sound technologies
12.b Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products	12.b.1 Number of sustainable tourism strategies or policies and implemented action plans with agreed monitoring and evaluation tools
12.c Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities	12.c.1 Amount of fossil-fuel subsidies per unit of GDP (production and consumption) and as a proportion of total national expenditure on fossil fuels

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Sustainable Development for Climate Action

Goal 7 of the Millennium Development Goals (MDGs) was aimed at ensuring sustainable development. Its scope was limited to four targets: (a) integrating the principles of sustainable development into country policies and programmes (reverse loss of environmental resources); (b) reduce biodiversity loss, which included indicators such as reducing CO_2 emissions (total, per capita, and per $1 GDP, PPP), reducing consumption of ozone-depleting substances and ensuring proportion of fish stocks remained within safe biological limits amongst others; (c) halving the proportion of the population without sustainable access to safe drinking water and basic sanitation; and (d) improving the living standards of slum-dwellers. The post-2015 agenda, taking cognisance of scientific developments which highlight the significant challenges posed by climate change, has a much wider scope, with almost all of its 17 Goals addressing environmental degradation. By making sustainability the central focus, Sustainable Development Goals (SDGs) acknowledge the intrinsic relationship between human development and climate change.

Goal 13 in particular focusses on the "urgent action" required to "combat climate change and its impacts", thus incorporating both climate change mitigation and climate change adaptation. Its scope includes three targets: 13.1, strengthen resilience and adaptive capacity to climate related hazards and natural disasters in all countries; 13.2 integrate climate change measures into national policies, strategies, and planning; and 13.3, improve education, awareness raising and human institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning.

Crucially, Goal 13 acknowledges the role being played by the United Nations Framework Convention on Climate Change (UNFCCC), and thereby looks to minimise duplication of efforts, and ensure efficient and effective utilisation of limited resources. Having said that, by laying the responsibility of tackling climate change at the doorstep of the UNFCCC, the SDG agenda has restricted its ambitions to one framework, unlike say Goal 17, which provides new avenues for international development (such as south-south cooperation). The Paris Agreement, signed in December 2015, is meanwhile based entirely on the voluntary contributions of member states, making it imperative that national action comes together to fulfil global ambition. Therefore, in a sense, implementing the SDG agenda at home will be central towards action on climate change.

India's Preparedness on SDGs 13

Target 13.1: Strengthen resilience and adaptive capacity to climate related hazards and natural disasters in all countries; and

Target 13.2: Integrate climate change measures into national policies, strategies, and planning

India is also the world's fourth largest energy consumer and the world's third largest carbon emitter[1]. It is also one of the most vulnerable countries in the world to climate change impacts.[2] Post the UNFCCC COP 19 at Warsaw, where all Parties were invited to initiate and/or intensify domestic efforts towards their Intended Nationally Determined Contributions (INDC), the Government of India took measures to work towards India's INDC on mitigation, adaptation,

finance, technology, and capacity building. These contributions take into account not just India's domestic obligations of mass poverty alleviation, but also the challenges of food security and nutrition, universal access to education and health, gender equality and woman empowerment, water and sanitation, energy, employment, sustainable cities and human settlement, and the means to achieve sustainable development goals.[3] The main driver of India's INDC efforts is the National Action Plan on Climate Change (NAPCC) (see Box 1). Established in 2008, the Plan sets forth the measures India will take to ensure advancement of the Indian cause on both the environment and the development front. India has also committed to ambitiously increasing its renewable energy capacity as well as financing adaptation action through domestic resources in its NDC.

The Government, in 2011, also took a significant step towards incorporating Green National Accounting. An expert committee's report in 2013 gave a five-step implementation process for a System of Environmental Economic Accounting in India.[11] However, it is not only the Indian government that is reacting to the dangers of climate change; corporations too have realised the importance of sustainable development. In early 2015, 213 companies pledged to increase the country's renewable energy capacity to 266 GW over the next five years thereby significantly reducing India's dependence on fossil fuels. Financial institutions too have made a commitment to finance green projects to the tune of 78 GW – the government expects this will mean an investment of US$ 200 billion.[12]

Box 1: National Action Plan on Climate Change (NAPCC) and Other Initatives by the Government of India

The NAPCC consists of eight National Missions, namely, Jawaharlal Nehru National Solar Mission, National Mission for Enhanced Energy Efficiency, National Mission on Sustainable Habitat, National Water Mission, National Mission for Sustainable Agriculture, National Mission for Sustaining the Himalayan Ecosystem, National Mission for a Green India, and the National Mission on Strategic Knowledge for Climate Change. Under these initiatives, the Government has been able to make significant strides – for instance, as of December 2014, 2,970 MW of grid-connected solar generation capacity had been installed.[4] Further, as of January 2015, 90 per cent of companies were on track to meet their Perform Achieve Trade[5] scheme targets due to investments in new energy saving technologies, resulting in about US$ 5 billion saved in oil imports (based on average Brent crude prices over the 3 year period) and electricity savings of that equivalent to the output of 5 coal-fired power plants.[6] In fact, the energy intensity of the Indian economy has declined by 30 per cent between 2000 and 2011.[7]

Apart from these initiatives, the Indian government setup the National Clean Energy Fund (NCEF) in 2010 to finance and promote clean energy initiatives along with allocation of resources for clean energy research. Finance is raised for the fund by levying a cess of Rs. 200 (the initial cess was Rs. 50, which was raised in 2014 to Rs. 100[8], and ultimately Rs. 200 in 2015).[9] As of December 2014, Viability Gap Funding (VGF) of Rs. 16,511.43 crore (US$ 2.75 billion) had been recommended from the NCEF for 46 projects.[10] Along with funding innovative schemes such as the Jawaharlal Nehru National Solar Mission (JNNSM)'s installation of solar photovoltaic (SPV) lights and small capacity lights, the scope of the NCEF also includes projects under the Ministry of New and Renewable Energy (MNRE), which are being implemented under the flagship programmes of "Grid Interactive and Distributive Renewable Power" and "Research Design, Development in Renewable Energy".

Source: Authors' compilation.

Target 13.3: Improve education, awareness raising and human institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning.

On the awareness front, India's efforts date as far back as 1986 when under the Ministry of Environment, Forest, and Climate Change, the National Environment Awareness Campaign was launched. The campaign looks to bring together a wide group of stakeholders including non-governmental organisations, educational and training institutions, professional associations, scientific bodies, and community organisations. Each year, the campaign focusses on a particular theme, which is then implemented by the designated Regional Resource Agencies (RRAs) for specific states/regions of the country. For the year 2014-15, the theme was "Combating Desertification, Land Degradation and Drought". Previous themes include "Bio-diversity Conservation", and "Forests for Sustainable Livelihood", amongst others.

India is highly vulnerable to natural disasters and extreme weather events. Following the 2004 Indian Ocean tsunami, which killed more than 10,000 people, central and state governments in India have begun investing in early-warning systems. Considering one-third of the Indian population lives in coastal areas – at risk from tsunamis, cyclones and storm surges – early warning systems are vital and have the ability to save millions of lives. At the national level, the Indian Ministry of Earth Sciences has established the National Tsunami Early Warning System at the Indian National Centre for Ocean Information Services (INCOIS) in Hyderabad, Andhra Pradesh.[13] State governments such as the Tamil Nadu government are also investing in early warning systems along with other coastal states at risk such as Odisha and Andhra Pradesh, all of which are part of the Cyclone Risk Mitigation project.[14]

Adaptation is also a high priority action area for the Indian government given the high vulnerability of the significant percentage of the Indian population that lives in rural areas with limited infrastructure. The Government of India launched the Climate Change Adaptation in Rural Areas of India (CCA-RAI) in 2009 with the objective of integrating adaptation to climate change in sector policy decisions of central and state governments and rural development programmes.[15] The programme developed state-level vulnerability assessments, tested adaptation measures and contributed to human capacity development through training measures aimed at mainstreaming adaptation concerns into developmental planning at regional and sub-regional levels.[16]

The International Framework

Despite all efforts by Indian policymakers, the capacity of the country to make significant strides with regards to climate change is largely dependent on international agreements. A major constraint that has emerged (for India and other developing countries) as a result of these agreements is that of access to finance. According to the UNFCCC, 'climate finance' refers to "local, national or transnational financing, which may be drawn from public, private and alternative sources" to tackle the effects of climate change.[17]At the 15th Conference of Parties to the UNFCCC held at Copenhagen in 2009, developed countries committed to jointly mobilise US$ 100 billion a year by 2020 from a "wide variety of sources, public and private, bilateral and multilateral, including alternative sources of finance". In the short-term, a commitment was made to raise US$ 30 billion between 2010 and 2012 through 'fast-start' finance. The Paris Agreement once again notes the figure of US$ 100 billion as the 'floor' to climate finance efforts and a transparency mechanism has been established at COP 21 which will work towards monitoring the progress towards that figure.

While the short-term commitments have been fulfilled through the Development Assistance route adopted by developed countries, it is still largely unknown how the long-term commitments will be met. Apart from the bilateral agreements and Multilateral Development Banks (MDBs) route, the Green Climate Fund (GCF), (based out of South Korea), is the only other credible institutional arrangement, which can be seen as a viable source for long-term climate finance. Established at COP 16, GCF is an operating entity of the Financial Mechanism of the Convention and will "support projects, programmes, policies and other activities in developing country Parties". The other source of funding through the Financial Mechanism, the Global Environment Facility (GEF), has limited capacity and as of June 2014, had funded 787 projects amounting to just over US$ 4.5 billion. While its capacity will be strengthened since its inception, the US$ 4.43 billion pledged for the sixth replenishment period (20014 to 2018) is only a drop in the ocean.[18]

As per United Nations Environment Programme (UNEP) estimates, to build 'green infrastructure' and to invest in low-carbon projects that will restrain global average temperature from rising more than

Table 2: Climate Finance - Estimated Annual Investment Needs v/s Actual (US$ Billion)

Finance Demand					Actual Supply (2012)
Year	2020	2030	2035	2050	
Mitigation					
IIASA (2012)				400-900	337
IEA (2014)			550		
McKinsey & Co. (2010)		1076		610	
WEF (2010)		700			
Adaptation					
Parry et.al. (2009)		4-100			22
UNFCCC (2007)		49-171			
World Bank (2010)		70-100			

Source: The Global Landscape of Climate Finance, CPI (2013).

two degrees centigrade above pre-industrial levels, nearly US$ 1 trillion of additional investment will be required annually upto the year 2030.[19] This is over and above the US$ 5 trillion needed annually until 2020 to finance investments in sectors such as agriculture, telecommunications and power.[20] Concurrently, investments will also be needed in social sectors like health and education. The International Energy Agency (IEA) reckons that the prevailing global policies and market structures are incapable of guiding investments towards low-carbon and energy efficient avenues at the speed and scale required.[21] According to IEA estimates investments in energy supply and energy efficiency alone will require US$ 53 trillion (US$ 39 trillion for energy supply and US$14 trillion for energy efficiency) upto 2035 to enable the world to adhere to a two-degrees-centigrade emissions path. However, as Table 2 illustrates, there is a stark gap between demand and supply (as of 2012, only US$ 359 billion had been earmarked towards climate finance).

In the next fifteen years, the global economy will need an estimated US$ 89 trillion in infrastructure investments[22] (India itself needs US$ 1 trillion over the next five years to bridge its infrastructure deficit[23]). A further US$ 4.1 trillion will be needed for incremental investment in low-carbon transitions to stay within the two-degree-Celsius temperature rise limit agreed internationally.[24]Thus while the challenges of development and climate change are highly convoluted, it is imperative that climate finance does not become a substitute for development finance, and must be seen as 'additional finance'. A conscious effort must thus be made to not conflate climate finance with Overseas Development Assistance, even if there is an overlap in the development projects that eventually get supported.

In this context, what is required is innovative solutions, and statesmanship from global leaders. Post the Financing for Development conference in Addis Ababa, Ethiopia, many in the developing world were left disillusioned as to whether a global agreement could be reached. Paris however delivered a global agreement on efforts to combat climate change.

Going forward, India's climate policy and development policies are going to be shaped by three interlinked documents: the Paris Agreement (COP 21), the Sustainable Development Goals (SDGs) Agenda and the Indian NDC submitted to the United Nations Framework Convention on Climate Change (UNFCCC). All three affect India's national ambitions to grow infrastructure, ensure sustainable development and maintain economic growth. Financing is also an unanswered question that is an undercurrent to all three agendas, i.e. whether the global financial architecture can respond to the needs of this new development paradigm[25].

For the mobilisation of long-term finance, the COP must converge the conversations that take place at Basel on global banking norms, with those that take place at the climate conventions. Basel III must be modified to include an exception for green investments and to improve the flow of funds towards climate-related projects in developing countries. In addition, developed countries must refrain from

enforcing blanket restrictions on coal projects.[26] Not only is it unfair to expect developing economies to industrialise through sources other than coal, when most developed economies today followed this path, it is a counterproductive proposition as it denies developing countries the opportunity to transition from inefficient coal based power to cleaner coal based generation technologies. The World Bank has also restricted loans for building coal-fired power plants since 2013; and in November 2015, the Organisation for Economic Cooperation and Development (OECD) agreed to limit most state financing to 'ultra-supercritical plants,' which burn less coal to produce the same amount of electricity[27].

Lastly, as the Table 2 highlights, a disproportionate sum of climate finance is directed towards climate mitigation, when compared with climate adaptation. One reason for this trend is that investors are aware of returns on investment when it comes to mitigation activities, however when it comes to adaptation, such awareness is lacking. There is also a lack of awareness amongst financial institutions as to what business opportunities exist and how these may be leveraged by investors. In this context, the UNFCCC must play a critical role and ensure the knowledge gap is narrowed. The multinational development banks too can contribute by taking the lead and partnering with organisations adept at identifying and implementing adaptation development projects. Once this is done and a market is created for adaptation projects, the private sector will crowd-in, as it has in traditional sectors.[28]

Conclusion

It is important to recognise the differences between the aspirations of the SDGs and the unfolding natural phenomenon that is climate change. In the case of sustainable development, the core goal is poverty eradication whilst balancing environmental imperatives. In the case of climate change, mitigation and adaptation actions lie at the heart of the issue. Nevertheless, these two agendas are clearly linked. Access to energy is critical to global development. The World Energy Outlook Report 2002 for example highlights that lack of access to electricity hinders poverty reduction programmes[29] while the positive correlation between energy access and rising income levels have been highlighted in other studies[30]. On the other hand, burning fossil fuels and cheaper sources of energy compromise mitigation action in the fight against climate change.

In India, an estimated 300 million people lack access to electricity. Successfully addressing the challenge of India's energy poverty lies at the heart of achieving the SDGs aspirations for poverty reduction and removal of social and economic inequality. Yet, India's total emissions are the third highest in the world and the country is under pressure to contribute significantly to global action on climate change.

To successfully advance the economic and social pillars of the SDG agenda in the country, while remaining cognisant of its environmental imperatives, India must adopt a nuanced approach towards climate action. It must protect its right to provide lifeline energy to its poor, as it transitions from a low-income agrarian society, to a middle-income industrialised country. At the same time, India's targets for expanding its renewable energy capacity as committed in its NDC and its taxes on consumption of petrol, diesel and burning of coal all indicate that it is firmly committed to combating climate change and reducing the energy intensity of its economy. Lifestyle energy consumption is therefore up for grabs as are further measures such as introduction of a tax on corporate emissions as possible policy instruments to strengthen India's climate action.

It is in India's interest to be propositional as it seeks to protect its 'lifeline' objectives and encourage the developed countries to be more ambitious in their green agendas that will offer more carbon space to the rest. While the challenges of poverty and energy access go hand in hand, vulnerability to climate change is also felt more severely by the poor. Enhancing adaptation action in the country and progressively transitioning to a green economy will both increase India's ability to meet the SDGs while also display international leadership on climate change.

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Goal 13. Take urgent action to combat climate change and its impacts: Targets and Indicators	
13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	13.1.1 Number of countries with national and local disaster risk reduction strategies*a* 13.1.2 Number of deaths, missing persons and persons affected by disaster per 100,000 people*a*
13.2 Integrate climate change measures into national policies, strategies and planning	13.2.1 Number of countries that have communicated the establishment or operationalization of an integrated policy/strategy/plan which increases their ability to adapt to the adverse impacts of climate change, and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production (including a national adaptation plan, nationally determined contribution, national communication, biennial update report or other)
13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	13.3.1 Number of countries that have integrated mitigation, adaptation, impact reduction and early warning into primary, secondary and tertiary curricula 13.3.2 Number of countries that have communicated the strengthening of institutional, systemic and individual capacity-building to implement adaptation, mitigation and technology transfer, and development actions
13.a Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible	13.a.1 Mobilized amount of United States dollars per year starting in 2020 accountable towards the $100 billion commitment
13.b Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities	13.b.1 Number of least developed countries and small island developing States that are receiving specialized support, and amount of support, including finance, technology and capacity-building, for mechanisms for raising capacities for effective climate change-related planning and management, including focusing on women, youth and local and marginalized communities

14
Marine Resources and the Challenges to Sustainability

Introduction

The oceans and seas are essential for national and global economic well-being. The global ocean economic activity is estimated to be between US$ 3 trillion to US$ 6 trillion. Marine transport and coastal tourism (comprise 5 per cent of the global gross domestic product) and 6 to 7 per cent of global employment and13 of the world's 20 megacities are coastal. Further, marine bioresources supply 4.3 billion people with more than 15 per cent of annual consumption of protein, energy and nutrients. Over 30 per cent of global oil and gas produced are extracted offshore, and marine tides, waves, currents, and offshore wind are emerging non-conventional sources of energy that have significant potential to contribute to low-carbon energy in many coastal countries (Cicin-Sain, 2015). It is estimated that about 40 per cent, or 3.1 billion, of the world's population lives within 100 kilometres of the coasts in about 150 countries.

However, the focus on oceans, seas and coastal areas in achieving sustainable development has been rather limited. For example, there has been no reference to oceans and seas in the Millennium Development Goals (MDGs). This necessitated countries, especially the Pacific Island States and Timor-Leste to push for a specific Development Goal on oceans and seas when negotiations began in the United Nations Open Working Group (OWG) to develop a set of Sustainable Development Goals (SDGs) a part of the post-2015 development agenda.

The SDG 14, "Conserve and sustainably use the oceans, seas and marine resources for sustainable development", with its seven targets and three provisions on means of implementation lends a credible hand to decades of work that articulated the need for special focus on this issue. The Target 14.7 "By 2030 increase the economic benefits to small island developing States (SIDS) and least developed countries (LDCs) from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism" emphasis that enhanced benefits to SIDS and LDCs are long-overdue and will cause a profound shift in consideration of ocean management decisions to highlight their economic and social impacts. The Samoa Pathway[1], adopted by SIDS in 2014 lay emphasis on ensuring achievement of sustainable development using a range of options, including the influences SIDS can make in delivering the post-2030 sustainable development agenda.

Shifting Gears to Action

The Global Agenda

With the adoption of the SDGs by the United Nations General Assembly (UNGA) in September 2015, the focus on the 2030 Agenda and the SDGs shift to actions on the ground and national implementation to achieve the targets using the means of implementation and relevant indicators. However, it has to be emphasised that achieving SDG 14 is not possible as a stand-alone option. As noted in the introduction to the document on SDGs, the OWG noted that "These goals constitute an integrated, indivisible set of global priorities for sustainable development".[2]

Thus, countries need to focus on several other SDGs to achieve SDG 14 on oceans and seas, including proposed SDG 1 (on poverty), SDG 2 (on food security), SDG 6 (on water and sanitation), SDG 7 (on energy), SDG 8 (on economic growth), SDG 9 (on infrastructure), SDG 10 (on reduction of inequality), SDG 11 (on cities and human settlements), SDG 12 (on sustainable consumption and production), SDG 13 (on climate change), SDG 15 (on biodiversity), and SDG 17 (on means of implementation and partnerships).

The Summary of the First Global Integrated Marine Assessment, or World Ocean Assessment[3], found that the sustainable use of the oceans cannot be achieved unless the management of all sectors of human activities affecting the oceans is coherent. Managing the human uses of the oceans and seas has to be divided among many players. In the course of their activities, individuals and commercial enterprises that use the ocean on a constant basis take decisions that affect the human impacts on the ocean. The United Nations Convention on the Law of the Sea[4] establishes the legal framework within which all activities in the oceans and seas must be carried out. National governments and regional and global intergovernmental organisations all have their parts to play in regulating those activities.

However, each of those many players tends to have a limited view of the ocean that is focussed on their own sectoral interests. Without a sound framework in which to work, they may well fail to take into account the ways in which their decisions and actions interact with those of others. Such failures can add to the complexity of the manifold problems that exist. While there has been a lot of emphasis to focus on ecosystem services that support human well-being, it has to be understood that sustainable management of oceans and seas shall deal with both resources that are a part of market economy (fish, hydrocarbons or minerals) or the non-marketed ecosystem services that the ocean provides to the planet. Consideration has to be given for scientific understanding of those ecosystem services and the Earth's hydrological cycle, interactions between air and sea, primary production and ocean - based carbonate production and the aesthetic, cultural, religious and spiritual ecosystem services (including some cultural objects that are in trade).[5]

The governance of oceans and seas also pose significant challenges for both policy making and implementation. According to a recent report from the United Nations Environment Programme (UNEP) on the governance of marine and coastal areas, '*Marine areas and resources under national jurisdiction, on the other hand, have relatively poorly defined rights of access and use, and are rarely subject to private property rights, such areas and resources generally being recognised as state property. State ownership of marine areas and resources within the Exclusive Economic Zones (EEZ) has been legally specified under the United Nations Convention on the Law of the Sea (UNCLOS, 1982), but the reality is that marine areas and resources are subject to complex combinations of state, open access (often de facto where state capacity to regulate is lacking) and common property (often having evolved in seas subject to de facto open access) regimes, private property regimes being a rarity in our seas, hence the customary principle of the 'freedom of the seas' that UNCLOS both reinforces and challenges'* (Jones, Qiu and Santo, 2011).

The United Nations General Assembly in its resolution 70/1 mandated the UN Statistical Commission to develop and implement a global indicator framework. An Inter-Agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDG) was established to develop a set of indicators for SDGs with an agreement to present the outcomes by March 2016 to the Economic and Social Council and the General Assembly. The General Assembly resolution 70/1 calls for the framework as "simple yet robust, address all Sustainable Development Goals and targets, including for means of implementation, and preserve the political balance, integration and ambition contained therein".

National Action

Historically, India's focus on oceans and marine resources management has been forward looking. With close to 129 institutions in the country working on marine and ocean related issues, largely supported by four ministries of Government of India, the challenge is the lack of coordination and cooperation among many of these institutions and programmes. Case in point is the lack of one single dataset of information

on marine resources, ocean management actions and status and trends in national and state level resource availability and use issues.

A quick assessment of the global targets and related indicators being suggested as well as under development indicate that though all of the targets and indicators may be relevant for India, it has to spend considerable efforts to collate the information and data to deal with the indicators

Examples of these include, Target 14.c where there is no single institution to deal with regional and global ocean governance and management issue. The Ministry of Earth Sciences is the focal point ministry in the country to provide input on regional and global science based issues for policy making while the Ministry of External Affairs represent the country at the international meetings and negotiations. There is need for enhanced cooperation amongst these Ministries along with Ministry of Science and Technology, Ministry of Rural Development, Ministry of Agriculture and state level counterparts to effectively realise the Goal and targets on oceans and seas. The following table highlights some options for India to realise the Oceans Goal.

Preparing India to Achieve the SDG

India's development interests and priorities seem to be going through a renewed phase of policy prescriptions directed by the new political environment in the country. The diversity of issues to be addressed, challenges to coordination, options to monitor and evaluate progress, partnerships to be created across strata of the society, emerging dimensions of bilateral and multilateral diplomacy and effectiveness of resource deployment form the core of issues that India need to address to move forward national debates related to adoption and subsequent implementation of SDGs at national level.

To support kick-starting such actions and prioritisation, the following may be not just relevant but important considerations.

Dealing with Data and Information

One of the critical needs to assess progress in implementing national actions to achieve the SDG 14 is to collate data and information related to agreed targets and indicators. Given the diversity of targets and suggestive indicators, it can be safely assumed that there will be a need for significant amount of data and information that need to be collated and analysed.

Such diversity of data and information need to be collected and collated from a wide range of actors, including civil society to effectively use the data for measuring progress. Current experiences from India on such consolidated reporting using the MDG framework indicate that either data on indicators are not available and/or they are not being assessed appropriately by various agencies. The example cited on lack of reporting by India on Goal 7 is a case in point.[6]

India would need to look at the option of creating a special unit within its Statistics and Programme Implementation Department of the Government that will be mandated to work on identifying data and information gaps, suggesting options and indicators for measuring progress aligning with the global indicators, create a network of ministries, institutions and civil society organisations to generate data and assess the same. Given the expertise available in India on a range of issues relevant to the SDGs in general, such an approach could benefit planning and monitoring national and local action.

Achieving National Development as an Aggregate of State level Development

Achieving SDG 14 in India needs to be measured using metrics available at state and national levels. The Goal can be achieved if there is concerted collaboration and consolidation of actions at national and state levels.

For this to happen, it is important to inform and facilitate effective participation of all states in deciding on implementation of the SDG 14, especially in relation to using the targets and indicators. States in India offer a spread-out platform for effective and speedy realisation of the SDG 14 targets. It may be appropriate for the new planning body created in India, NITI Aayog to focus on this issue as an additional part of its cooperative federalism approach.

Financing Development

In July 2015, governments convened for the Third Conference on Financing for Development in Addis

Table : Tweaking the Indicators to Suit India

Targets	Indicators	Relevant National Indicator
Target 14.1: By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.	14.1.1 Index of coastal eutrophication and floating plastic debris density.	• Run off into rivers, seas and oceans. • Amount of waste water flows directly into the seas and oceans. • Level of eutrophication of estuaries. • Number of initiatives by state governments on protection of coastal and marine resources.
Target 14.2: By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans.	14.2.1 Proportion of national exclusive economic zones managed using ecosystem-based approaches.	• Number of Marine Protected Areas designated and managed. • Extent of restored mangroves and estuaries. • Spatial planning strategies for coastal and marine areas.
Target 14.3: Minimise and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels.	14.3.1 Average marine acidity (pH) measured at agreed suite of representative sampling stations.	• National climate policy that considers a measurable de-carboinisation strategy. • Reduction in the amount of CHC emissions in the AFOLU sector. • Ocean acidity measurements. • National Climate Change Action Index.
Target 14.4: By 2020, effectively regulate harvesting, and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, to restore fish stocks in the shortest time feasible at least to levels that can produce maximum sustainable yield as determined by their biological characteristics.	14.4.1 Proportion of fish stocks within biologically sustainable level.	• Sustainable harvesting practices indices for fisheries and coastal resources. • Certification schemes for sustainable fishery catch and management. • Synergies between state and national level organisations and institutions on developing and implementing sustainable bio-resource management plans and actions.
Target 14.5: By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on best available scientific information.	14.5.1 Coverage of protected areas in relation to marine areas.	• National and state level marine and ocean resource conservation plans developed and used.

Target 14.6: By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, and eliminate subsidies that contribute to illegal, unreported and unregulated fishing fishing, and refrain from introducing new such subsidies, recognising that appropriate and effective special and differential treatment for developing and least developed countries should be an integral part of the World Trade Organisation fisheries subsidies negotiation.	14.6.1 Progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing.	• Reduction and subsequent elimination of subsidies at national and state levels that is not consistent with regional and global practice and standards.
Target 14.7: By 2030, increase the economic benefits to small island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.	14.7.1 Sustainable fisheries as a percentage of GDP in small island developing States, least developed countries and all countries.	• Social and economic benefits of fishing and resource management assessed for artisanal, sustenance and commercial fisheries and marine resources. • Reduction and subsequent ban on use of destructive fishing practices. • Extent of coastal area restoration promoting enhanced biodiversity.
Target 14.a: Increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the Intergovernmental Oceanographic Commission Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries.	14.a.1 Proportion of total research budget allocated to research in the field of marine technology.	• Nature and impact of collaboration between public and private institutions on resource management and use • Measures to enhance the impact of investments into institutions – public sector – that results in collective impacts on resource use and enhancement.
Target 14.b: Provide access for small-scale artisanal fishers to marine resources and markets.	14.b.1 Progress by countries in the degree of application of a legal/ regulatory/policy/ institutional framework which recognises and protects access rights for small-scale fisheries.	• Nature and type of access to marine resources for small-scale artisanal fishers and subsistence fisheries.

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Target 14.c: Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in the United Nations Convention on the Law of the Sea, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of "The future we want".	14.c.1 Number of countries making progress in ratifying, accepting and implementing through legal, policy and institutional frameworks, ocean related instruments that implement international law, as reflected in the United Nation Convention on the Law of the Sea, for the conservation and sustainable use of the oceans and their resources.	• Active participation in regional and international negotiations (eg. the ongoing UN led negotiations for a legally binding agreement on management of resources in areas beyond national jurisdiction. • National actions on synergies between Conventions and processes at global and regional levels. • Number of action programmes that respond to the international governance schemes.

Ababa and adopted the Addis Ababa Action Agenda (AAAA)[7] that calls for specific and predictable financing for achieving the SDGs. Given the diversity of needs and challenges India faces it is important not only to identify additional and new ways of enhanced finances along with ensuring appropriate and timely deployment of finances. In an unpublished study by the National Biodiversity Authority (NBA) in 2012 it was estimated that the amount of money spent, annually, in support of biodiversity conservation actions in India is to the tune of Rs. 11,000-15,000 crores – both as direct and indirect support. However, the impact of this investment is hardly felt since the investments are dissipated, unavailable in timely manner for prioritised action.

The role and relevance of private sector funding as well as resources raised through civil society groups is yet to be fully assessed in India. In order to achieve inclusive results in sustainable development it is important to forge long term partnerships with private sector and civil society groups in India. Specific and predictable guidelines should be made available under the newly enacted Corporate Social Responsibility (CSR) law to ensure part of the proceeds from the revenue collections should be earmarked for a specially created trust fund aimed to support SDG implementation at local levels.

Delivering as One but at Multiple Levels

The advantage as well as challenge for a country like India in dealing with sustainable development is the need for outreach at various levels and using diverse set of approaches. While a national framework on SDGs is needed to channel investments, finances, expertise and outreach, it will be very important to design differential approaches to deliver the actions for impactful results. The role of people-centric approaches to sustainable development action can only be strengthened using multiple interventions at multiple levels. For example, in fisheries sector, India needs integrative approaches to deal with management and adaptation.

Conclusions

India's asset is its diversity of institutions and expertise available to deal with issues related to achieving SDG 14. While the current plans and approaches need an overhaul to effectively deal with achieving the goal and targets of this SDG, it is also important to take the responsibility and ownership of achieving the same to States, local bodies and the civil society including the corporate sector.

NITI Aayog with this mandate and ability to oversee action to deal with SDGs need to have a

special focus on enhancing synergies and cooperation amongst agencies and institutions as well as ensure that finances that are deployed on issues related to SDGs are relevant, appropriate and impactful.

While India can pride itself as a society with historical consciousness to deal with sustainable development, it cannot bask in the past glory when the indications are that the society is fast moving towards unsustainable production and consumption patterns with local people at the receiving end of the vagaries of economic, social and environmental wrong-doings. SDGs offer yet another opportunity for us to walk the talk.

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15
Sustainable Management and Use of Terrestrial Ecosystem

Introduction

In the first year of the present millennium, with the main aim of eradicating poverty and fostering development, 189 countries agreed on the Millennium Development Goals (MDGs) consisting of eight goals, 21 related targets, measured by 60 official indicators.[1]

Rio+20 called for developing a set of inclusive Sustainable Development Goals (SDGs) drawing from the experiences of MDGs and integrating social, economic and environmental aspects.[2] Development cannot be sustainable without considering its environmental dimensions and poverty eradication cannot be achieved if ecosystem services and natural capital are degraded.[3] The UN General Assembly's Open Working Group (OWG) on Sustainable Development Goals brought out a proposal incorporating 17 goals, 126 level 1 targets and 43 level 2 targets to be achieved by the year 2030.[4] The post-2015 development agenda of India in the context of SDG 15 should build on all relevant existing international commitments, as MDGs, the Strategic Plan for Biodiversity 2011-2020 and Aichi Biodiversity Targets of Convention on Biological Diversity (CBD).

The MDG 7 had limited coverage of environmental sustainability issues, as desertification and land degradation and did not address mountain ecosystem, inland waters, grasslands, nor concentrated on drivers of biodiversity loss. A broad perspective of multiple synergies and trade-offs with other goal/targets is necessary. This paper presents an analysis of the progress in achieving the relevant MDG 7 "Ensure Environmental Sustainability" and an outline of the governance challenges and opportunities for implementing SDG 15 in India.

India's Progress and Gaps in Realising MDGs

Environmental objectives in the MDGs are reflected in MDG 7 and four subsidiary targets of which Targets 7a and 7b are relevant in the context of SDG 15.

Target 7a: *Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources*.

Target 7b: *Reduce biodiversity loss, achieving, by 2010, a significant reduction in the rate of loss*.

Indicator 7.1 : Proportion of Land Area Covered by Forest

India has added around 3 million hectares (mha) of forest and tree cover over the last decade.[5] The forest cover of the country increased from 6,90,899 sq km (21.02 per cent of the geographical area) in 2007 to 6,97, 898 sq km (21.23 per cent) in 2013.[6] In comparison to 2011 there is a total increase of 5,871 sq km of forest cover. The tree cover is estimated to be 91,266 sq km (2.78 per cent of geographical area) and an increase of 278 million tonnes of carbon stock of country was recorded with respect to 2011. The Indian Forest Survey 2013 has attempted to demarcate forest cover within green wash area (corresponding to recorded forest area) and outside green wash area. Out of the total increase in 5,871sq km, 132 sq km is observed within green wash area and 5,739 sq km outside green wash area.[7]

Indicator 7.6: Ratio of Area Protected to Maintain Biological Diversity to Surface Area

The country has been on track in increasing the protected area network for maintaining ecological balance. From a Protected Area (PA) network of 54 national parks covering 21,003 sq km and 373

sanctuaries covering 88,649 sq km (total 1,09,652 sq km or 3.34 per cent of the country's geographical area) in 1988, the network has increased to 103 national parks, 531 wildlife sanctuaries, 66 conservation reserves and 26 community reserves in 2015 thus totalling to 1,60,499.31 sq km (4.88 per cent of geographical area).[8] In addition 9 biosphere reserves and 465 Important Bird Areas (IBAs) have been identified in India. 40 per cent of these IBAs fall outside the PA network and contain a range of habitats. Currently, there are 19 species recognised by the Alliance for Zero Extinction (AZE) in India, affirming India's commitment to zero extinction as outlined in Aichi Biodiversity Target 12. A total of 141 community conservation areas covering an area of 1,57,046 hectares (ha) have been identified for conservation measures and 110 Medicinal Plants Conservation areas, each of an average size of 200 ha, have been set up across 13 States of India.[9] In addition the managed forests under the State Forest Departments are also contributing towards biodiversity conservation. Thus, India has over 20 per cent of the total geographical area under effective biodiversity conservation, thereby exceeding the 17 per cent figure envisaged in Aichi Target 11.[10]

Indicator 7.7: Proportion of Species Threatened with Extinction

The Red List Index, used to measure progress towards the Aichi Target 12 and the MDGs show that globally a substantial proportion of species are declining overall in population and distribution. Terrestrial species declined by 39 per cent between 1970 and 2010. The Living Planet Index for freshwater species shows an average decline of 76 per cent.[11]

India is known to have over 6.7 per cent of animal species that the world holds and 3.7 per cent of the world's threatened vascular plants are in India. In India, 7.7 per cent of vascular plant species are under threat, while at global level, 13.8 per cent vascular plants are in a similar position.[13] Species-specific projects (Project Tiger, Project Elephant and Project Snow Leopard) are under implementation across the PAs as well as in areas outside the PA network. Species recovery plans for 16 terrestrial and 7 marine species (Dugong, four species of Sea turtle, Irrawaddy dolphin and Whale shark) are being prepared. Periodic assessment and updating of species protected under Wildlife Conservation Act of India is necessary (Table 1).

Table 1: Indian Fauna under IUCN Threat Categories[12]

IUCN Red List Category	Number of species (n = 4681)
Extinct	1
Critically endangered	73
Endangered	198
Vulnerable	375
Near Threatened	322

Source: ENVIS Centre on Wildlife and Protected Areas

Integration of Sustainable Development into Country Policies and Programmes

India has been part of several international agreements such as the Ramsar Convention on Wetlands, Convention on International Trade in Endangered Species of Fauna and Flora (CITES), CBD, etc. India has put in place various statutory provisions for conservation of the country's natural resources. These include:

- The Indian Forest Act 1927
- The Wildlife Protection Act 1972
- The Water (Prevention and Control of Pollution) Act 1974
- The Forest (Conservation) Act 1980
- The Environment (Protection) Act 1986
- The Biological Diversity Act 2002
- The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act 2006

Green India Mission aims to increase forest and tree cover in 5 mha and improve quality of forest cover in another 5 million hectares (mha) on a landscape based approach.14 The National Afforestation Programme (NAP) is a flagship scheme of India. India has also established six National Bureaus dealing with genetic resources of plants, animals, insects, microorganisms, fish and soil sciences. The twelfth five year plan (2012-2017) mooted a four-pronged strategy of 'growth, inclusion, carbon mitigation and local environment benefits.[15]

Sustainable Development Goals: An Overview and Interlinkages

SDGs 12 through 15 focus on strategies for reversing the negative impacts of economic development on

ecosystems and the services they provide. SDG 12 (Targets 12.2, 12.8) focusses on reducing the pressure on resources through promotion of sustainable consumption and production pattern. SDG 15 is linked to SDG 2 on food security (Targets 2.3, 2.4, 2.5), SDG 6 (Targets 6.3, 6.4,6.5,6.6) on water and sanitation, SDG 11 (Targets 11.4, 11.6, 11.7) on sustainable cities and SDG 13 (13.1) on Climate Change. SDG 15 shows clear linkages with other UN environmental agreements and incorporates 9 level 1 targets and 3 level two targets.

SDG 15 and National Context

Land Degradation

At the Rio+20 Conference, world leaders recognised that desertification, land degradation and drought, were challenges affecting sustainable development. In the last two centuries, humans have converted 70 per cent of the grassland, 50 per cent of the savannah, 45 per cent of the temperate deciduous forest, and 27 per cent of the tropical forest biome to agricultural land.[16] While the world's drylands continue to be the most vulnerable and threatened by desertification, land degradation and drought (DLDD), 78 per cent of the total degraded land is located in terrestrial ecosystems other than drylands.[17] Globally the percentage of total land area that is already degraded or being degraded has increased from 15 per cent in 1991 to 24 per cent in 2008.[18]

India has a total geographical area (TGA) of 328.2 mha with drylands covering 228.3 mha (69.6 per cent of the total land area). Land is a natural capital vital for food security, regulating hydrological regimes, nutrient recycling and storing carbon, and other ecosystem services. The total area of India undergoing the process of land degradation is 105.4 mha that is about 32 per cent of the total land. The major process of land degradation is soil erosion (due to water and wind erosion), contributing to over 71 per cent of the land degradation in the country. Water erosion, the most widespread form of degradation, occurs widely in all agroclimatic zones. It has caused up to 33.56 mha (10.21 per cent of TGA) of land degradation. Wind erosion dominant in the western region, leading to loss of topsoil and shifting of sand dunes, has caused upto 17.56 mha of degradation (5.34 per cent of TGA).[19]

Fragmentation

A considerable area of forests is under low fragmentation i.e 49.63 per cent of TGA, 21.89 per cent under medium while 5.16 per cent is under high fragmentation.[20] Although India has improved its aggregate forest cover, India's forests have changed from multi-product and multi-layer to timber oriented, affecting livelihood of forest-dependent communities.[21]

Inland Fresh Water Ecosystems

India has about 7,57,060 wetlands with a total wetland area of 15.3 mha, accounting for nearly 4.7 per cent of the TGA of the country. Out of this, area under inland wetlands accounts for 69 per cent, coastal wetlands 27 per cent, and other wetlands (smaller than 2.25 ha) 4 per cent.[22] The Millennium Ecosystem Assessment evaluates that the beneficial expansion of public water supply for households and industry may result in a large increase in wastewater loadings to freshwater ecosystems in many developing regions during the 21st century.[23] A holistic approach considering interlinkages between the SDGs dealing with water resources (Targets 15.1 and 6.6) has to be followed to achieve sustainability.

Desertification

In India degradation occurs in arid, semi-arid and dry sub-humid areas where productivity is constrained by water availability, leading to desertification. About 81.45 mha is being subjected to desertification, i.e. 25 per cent of the TGA of India is affected by desertification.[24] About 69 per cent of the country's lands are drylands and degradation of these lands has severe implications for the livelihood and food security of millions. Desertification causes deterioration of the productivity of the fragile ecosystems, and increases poverty. In this context India's problem is not only sustainable land management but also reversing declines in productivity by restoring and regenerating land that is already degraded.

Mountain Ecosystem

The Rio conference, 1992 recognised the crucial role played by mountain ecosystems by highlighting that the livelihood of about 10 per cent of the world's population depended directly on mountain resources such as water, forests and agricultural products and minerals. In India mountain ecosystems cover 18 per cent of the geographical area and are inhabited

by 51 million people. Mountain areas are vulnerable to environmental degradation pressures placed by increasing population growth, tourism, infrastructure development, mining, etc. The working group on Indian Mountain ecosystem has recommended the following:

(a) Soil Conservation and managing the water resources for optimal utilisation and development of horticulture, floriculture and other agricultural usages.

(b) Strategy for disaster management in the States of mountain region.

(c) Nature conservation, involvement of community for management of forests, medicinal and aromatic plants, promotion of organic farming.

(d) Governance and Institutional framework for Spatial Planning and Sustainable Development.

Fair and Equitable Sharing of Benefits

The three pillars of CBD- conservation, sustainable use, fair and equitable sharing of the benefits arising from the utilisation of genetic resources form principal building blocks toward poverty eradication and sustainable development. In India Biodiversity Act 2002 and Rules 2004 address the issues relating to conservation of genetic resources and equitable sharing of benefits arising out of it through a decentralised three tier system. During 2014-15 National Biodiversity Authority (NBA) granted approvals to 19 applications from foreign nationals seeking access to Bioresources for research and commercial purposes and 14 applications for intellectual property rights (IPRs). The first internationally recognised certificate of compliance was issued by NBA on 1 October 2015, following a permit made available to the Access and Benefit-Sharing (ABS) Clearing House by India. The certificate serves as evidence of the decision by India to grant access to ethno-medicinal knowledge of the Siddi community from Gujarat to a researcher affiliated with the University of Kent in the United Kingdom.

Invasive Species

India has an estimated 18,000 plants, 30 mammals, 4 birds, 300 freshwater fishes and 1100 arthropods that are invasive which is one of the major drivers of biodiversity loss.

National and Local Level Planning and Poverty Reduction Strategies

At the local level, strengthening democratic institutions is necessary for sustained management of natural resources. Women's participation in local institutions governing natural resources is critical for sustainable forest and water management. Biodiversity Act 2002 promotes conservation and sustainable utilisation of bioresources by a three tier system comprising National Biodiversity Authority, State Biodiversity Boards and Biodiversity Management Committees (BMC) at local level. The role of natural resources in local livelihoods should be recognised as 200 million people are dependent on forests for their livelihood in India.

Consistency with Existing Agreements and Implementation of SDGs

The success of SDGs implementation framework depends on aligning targets with existing international agreements and SDGs can draw from what is agreed by CBD. Over the last year several proposals for a monitoring framework have been proposed which can be taken into consideration by India in addition to the National Biodiversity Targets (NBTs). This section analyses some of the complimentary targets and indicators.

SDG Targets and Aichi Targets

The Strategic Plan for Biodiversity 2011-2020 and its 20 Aichi Targets25 provide an agreed overarching framework for action on biodiversity and a foundation for sustainable development. Among the Aichi Biodiversity Targets, the following measurable targets are particularly pertinent for SDG 15:

Target 5: By 2020, at least halving deforestation and the loss of other natural habitats.

Target 7: Sustainably managed areas under agriculture, aquaculture and forestry.

Target 11: Protecting at least 17 per cent of land and 10 per cent of oceans through protected areas.

Target 15: Restoring at least 15 per cent of degraded lands.

The UN Convention to Combat Desertification (UNCCD)

UNCCD is a legally binding international agreement linking environment and development to sustainable

land management, Parties adopted a 10-year strategic plan for 2008-2018 with 4 main strategic objectives[26] and indicators, which are:

1) To improve the living condition of the people affected
   - Proportion of people living below poverty line
   - Decrease in number of people negatively impacted by process of desertification/land degradation/drought
   - Land cover status
2) To improve the condition of affected ecosystem
   - Reduction in total area affected by desertification/land degradation/drought
   - Increase in net primary productivity in affected areas
3) To generate global benefits through effective implementation of UNCCFD
   - Increase in carbon stock in affected areas
   - Areas of forest, agriculture, aquaculture ecosystem under sustainable management
4) To mobilise resources to support implementation of convention
   - Increase in level and diversity of funding for combating desertification/land degradation/drought
   - Development of policies and legal measures to address desertification/land degradation/drought

Sustainable Development and National Twelfth Plan

Sustainable development is a key agenda in National Twelfth Plan[27] which has identified deliverables consistent with SDG 15:

- Assess and remediate 12 identified contaminated sites with potential for groundwater contamination by 2017.
- Clean 80 per cent of critically polluted stretches in rivers by 2017 and 100 per cent by 2020.
- Greening 5 mha under Green India Mission including 1.5 million ha of degraded lands, afforestation and eco-restoration of 0.9 mha of ecologically sensitive areas.
- Technology-based monitoring of forest cover, biodiversity and growing stock including change-monitoring on periodical basis through dedicated satellite by 2017 and establishment of open web-based National Forestry and Environmental Information system for research and public accessibility by 2015.
- Engagement of Village Green Guards/Community Foresters for every Joint Forest Management (JFM) village by 2016.
- Establish forestry seed bank in forest circles and Model Nursery in every district with information on public portal by 2014.
- 20 per cent of veterinary professionals in the country will be trained in treating wildlife.
- Integrated Ecotourism District Plans covering 10 per cent of all potential Protected Areas (PAs) by 2017.
- Restore 0.1 mha of wetlands/inland lakes/water bodies by 2017.
- Mapping and preparation of biodiversity management plans for deserts (both cold and arid), coastal areas, important coral zones, wetlands, mangroves and so on to be completed by 2017.

SDGs and National Biodiversity Targets and Indicators

India has put in place an enabling legal mechanism under National Biodiversity Authority and a monitoring framework, National Biodiversity Targets[28] with indicators for each of the targets. Synchronisation of NBTs with SDG targets will contribute to development of a monitoring framework post 2015. India's National Biodiversity Targets (NBTs) 2, 3, 4, 5, 6, 8, 9, 10, 12 and Aichi Targets 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 17, 19, 20 are concomitant with SDG 15. This section attempts to draw the inter-linkages between the SDG targets, Aichi Targets and NBTs and corresponding indicators. Annex 1 depicts the national position.

An analysis of the National Biodiversity Targets and indicators in the perspective of SDG 15 reveals that two of the SDG targets namely 15.4 and 15.7 and one of the level two targets 15.c are not specifically addressed. Promoting integrated watershed development and alternative livelihood opportunities, generating and strengthening knowledge about the ecology and sustainable development of mountain ecosystems require a holistic approach. A composite indicator for conservation of mountain ecosystem and trends in poaching and illegal trade of protected species can be incorporated.

Challenges and Opportunities

India's major challenges include pollution of its inland rivers and waters; depleting fresh water sources and groundwater; land degradation, desertification,

fragmentation and biodiversity loss and unsustainable utilisation of natural resources. Although India is reporting a marginal increase in forest cover this increase can be attributed to the fact that there is no distinction made between natural forests (usually mixed biodiverse) and plantations (often monoculture).[29] A periodic assessment of the loss of non-forest ecosystems of biodiversity outside the PAs as also inviolate forest areas is necessary.

India with about 2.4 per cent of world's geographic area, supports 17 per cent of world's population and 18 per cent of global livestock population, faces severe pressure on land. India had a poverty ratio of 29.5 per cent during 2011-2012[30] and 200 million people are dependent on forests for livelihood. Forests also meet 30 per cent of fodder needs of the cattle population and 40 per cent of domestic fuel wood needs of the people. Achieving food security is a crucial pillar of human development but can have severe negative impacts on biodiversity through land-clearing, the introduction of non-native species, excessive water use, habitat conversion, excessive use of chemical fertilisers and pesticides, chemical run-off and soil and water contamination and declining soil fertility associated with unsustainable production. Large scale ecological losses occur due to soil erosion, soil alkalinity and salinity, micronutrient deficiency, water logging and fast depletion and contamination of ground water, principle cause being irrigation. With a global population projected to reach 9 billion by 2050, ensuring food, water and energy security will be the challenge before all governments.[31] India is still home to a quarter of all the undernourished population in the world.[32] In India at the current nutritional level, about 100 million tonne of additional food grains are needed by year 2020 to achieve food security which will aggravate pressure on dry land ecosystems leading to over exploitation of land and water resources. The total contribution of irrigated agriculture to food grain production in terms of area expansion and yield improvement is likely to be around 64 million tonnes by 2020 leaving a shortfall of 36 million tonnes necessitating added productivity from dry lands.[33] The 2014 Global Harvest Initiative Report estimates that India's domestic production will only meet 59 per cent of the country's food demand by 2030 at the current growth rate of Total Factor Productivity Growth.

In India 60.6 per cent of total land area is agricultural land , 35 per cent of the area is sown under irrigation.[34] Although agricultural land is constant for the past several years, 60 per cent of the total area under cultivation is substantially degraded. Most of this damage is in the form of loss of topsoil and gradual deterioration of soil health and thus long-term productivity. While agriculture expansion can contribute to terrestrial ecosytem decline, integrated land use planning, agroecological methods and maintaining genetic diversity of cultivated plants and their wild relatives can form part of the solution.

Linkage of goals with specific and measurable indicators is a prerequisite for monitoring and evaluation. Since the SDG 15 has inter-linkages with targets in several other goals, fragmentation of issues at multi-departmental level is inevitable which may lead to lack of coordination and wastage of resources. The complexity of a system with a multitude of institutions and stakeholders with diverse aims and competences has to be taken into account while formulating the SDG framework for a diverse nation as India.

Free and open access to biodiversity data and interoperability mechanism between scientific and research institutions and science policy interface has to be developed. *National Biodiversity Information Outlook* (2012)[35] advocated a national information grid for biodiversity, to facilitate monitoring and management of natural resources.

A key factor to ensure compliance is effective governance regimes at national and local levels. Efforts to improve governance through strengthening Panchayati Raj Institutions (PRIs) and developing interlinkages between complementary institutions as BMC, JFM, etc., is indispensable.

Emerging demands for integrating information on environmental sustainability and human well-being needs an understanding of what ecosystems provide in terms of both market and non-market goods and services. UN Statistical Commission has developed a system for environmental-economic accounting which can be used as a framework for studying the impacts of the economy on the environment and the contribution of the environment to the economy.

It is estimated that a REDD+ (Reducing Emissions from Deforestation and Forest Degradation) programme

Table 2: Funding for Biodiversity Conservation, 2013-2014

Nature of funding	Amount (in Rs. crores)
MoEF	
Core Forestry and Wildlife Research and development Conservation of natural resources National coastal management programme	1564.34 1195.83 153.51 90.00 125.00
Non-core	259.80
Total	**1824.14**
States	**5025.57**
Peripheral funding (Biodiversity related programmes of 23 departments under 77 schemes)	2354.74
Total	**9204.45 crores**

Source: India's Fifth National Report to Convention on Biological Diversity, 2014.

for India could capture more than 1 billion tonnes of additional CO2 over the next 30 years and provide more than US$ 3 billion as carbon service incentives under REDD+. A national REDD+ strategy needs to be implemented along with relevant Aichi Biodiversity Targets (5, 7, 11, 14, and 15) and National Biodiversity Targets (3, 5,6,14).

Financing Biodiversity

During COP12 it was reaffirmed to double total biodiversity-related international financial resource flows to developing countries using average annual biodiversity funding for the years 2006-2010 as a baseline. Governments also agreed to increase domestic financing for biodiversity and identified a set of actions to allow the increased mobilisation of financial resources from all sources.

The total budget allocated for Ministry of Environment, Forest and Climate Change (MoEF) for the year 2013-2014 was Rs. 2430 crores out of which the core funding for schemes relevant to biodiversity conservation was Rs. 1564.34 crores. Compared to 2010-2011 core funding has increased by 45 per cent. Allocation of funds by MoEF for forestry and wildlife has increased by 50.7 per cent, research and development by 46.6 per cent, conservation of natural resources has tripled and national coastal management programmes have been reduced by 17.2 per cent when compared with 2010-2011 levels (figures of 2013-14 is presented in table 2). Government of India through 23 Ministries/Departments and 77 schemes is implementing schemes relevant to biodiversity conservation

The highest allocation of funds is for NBT 6, NBT 1 and NBT 3 which are complimentary to SDG 15 and specifically address rate of degradation, fragmentation and loss of natural habitats. Of the combined allocations of all related ministries including MoEF maximum funds are allocated towards NBT 3, and least for NBT 7, safeguarding genetic diversity of cultivated plants and their wild relatives and NBT 4 management and identification of pathways of invasive alien species. In this context, NBT 7 needs special attention as maintaining genetic diversity within agricultural systems and adopting biodiversity friendly farming practices can provide solution to the problem of balancing food security and biodiversity conservation.

Conclusions

Experts are warning that the country may shortly reach a threshold where the combination of poverty, poor resource management and climate change will contribute to a significant, if not irreversible, increase in fragility. Healthy and productive soils/lands, forests, oceans and fresh water ecosystems, and the services they provide are critical for meeting this challenge. Protection of terrestrial ecosystems can be achieved only by sustainable forest management, conservation of inland waters, ecosystems, restoration of degraded

lands, biodiversity conservation, and sustainable use of natural resources which is envisaged in SDG 15. India has attained much progress since and has achieved the MDG in some sectors, but achieving sustainable development of its 1.27 billion people requires well defined targets and indicators. Protection and sustainable use of terrestrial ecosystem can be achieved only as part of an integrated agenda of land use, food security, biodiversity conservation, that also provides for access to drinking water, sanitation and renewable energy while mitigating climate change. People are at the centre of sustainable development and ultimately the effectiveness of implementing SDGs depends on how well they are integrated into a decentralised governance framework.

Endnotes

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Inter-linkages between the SDG Targets, Aichi Targets and NBTs and Corresponding Indicators

SDG 15, Target	National Biodiversity Target	Aichi Target	Composite Indicator	Indicator	Frequency of monitoring
15.9	2. By 2020, values of biodiversity are integrated in National and State planning processes, development programmes and poverty alleviation strategies.	2	Trends in incorporating natural resource/biodiversity/ ecosystem service values in national and state planning processes and development programmes	1) Trends in biodiversity and ecosystem services valuation studies 2) Trends in number and coverage of studies- The Economics of Ecosystems and Biodiversity (TEEB), Net Present Value (NPV) relating to biodiversity 3) Trends in number and effectiveness of measures developed in the Mahatma Gandhi National Rural Employment Guarantee Act programme (MGNREGA) and Integrated Watershed Management Programme (IWMP) for protection and enhancement of ecosystem services and biodiversity 4) Trends in biodiversity inclusive climate change adaptation and mitigation measures formulated/ implemented 5) Trends in area covered by catchment area treatment under irrigation projects	3 years
			Trends in integration of biodiversity and ecosystem service values into sectoral and development policies and programmes	1) Trends in studies on economic valuation of selected ecosystem services 2) Trends in reflection of biodiversity and ecosystem services in policy decisions, planning and reporting processes	3 years
			Trends in policies considering biodiversity and ecosystem services in environmental impact assessment andstrategic environmental assessment	1) Trends in numbers of studies on biodiversity inclusive environment impact assessment, Cumulative Environment Impact Assessment (CEIA) and strategic environment assessment (SEA) 2) Trends in identification, assessment, establishment and strengthening of incentives that reward positive contributions to biodiversity and ecosystem services	3 years
15.1 15.2 15.3 15.5	3. Strategies for reducing rate of degradation, fragmentation and loss of all natural habitats are finalised and actions put in place by 2020 for environmental amelioration and human well-being	5, 15	1) Trends in forest cover	Changes in proportions of forest cover in different forest categories i.e., Very Dense Forest (VDF), Moderately Dense Forest (MDF), Open Forest (OF) and Scrub)	2 years
			Trends in aquatic ecosystems	Changes in areas in riverine ecosystems and wetlands (terrestrial and coastal) Number of wetlands under integrated management plans	3 years *Continued...*

Continued...

			Trends in mangrove cover and coastal area management	• Change in mangrove cover over the years • Trends in area covered by integrated coastal area management	2 years
			Trends in river water quality	Changes in water quality (by interception, diversion and treatment of domestic sewage and preventing agricultural runoff, toxic wastes, industrial effluents, chemical wastes and unburnt bodies from entering water bodies)	2 years
			Trends in afforestation and restoration	• Monitoring canopy cover, grasslands and traditional grazing lands • Monitoring carbon stock • Assisted natural regeneration • Rehabilitation of mined-out areas	2 years
			Combating Desertification	• Trends in land degradation • Status of and trends in area of deserts, water levels in wells/groundwater table	2 years
			Species restoration after forest and water body restoration	Status of selected indicator species	3 years
			Trends in maintenance of fertility in agricultural lands using natural methods and means	• Soil health records • Organic carbon and humus build up • Trends in maintaining the health of near-pristine soils, being awarded titles under FRA in forest areas	3 years
15.8	4. By 2020, invasive alien species and pathways are identified and strategies to manage them developed so that populations of prioritised invasive alien species are managed.	9	Trends in invasive alien species Management	• Number and coverage of management plans developed for prioritised invasive species and integration with PA -management plans and wetland management plans. • Changes in area affected by invasive species	3 years
15.2	5. By 2020, measures are adopted for sustainable management of agriculture, forestry and fisheries.	6, 7, 8	Trends in sustainable forestry	• Trends in area of degraded forests • Trends in area of restored forests • Trends in proportion of products derived from sustainable sources	3 years
			Trends in stock sizes of target and bycatch fish species (freshwater and marine)	Trends in catch per unit	3 years

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			Trends in intensity of destructive fishing practices	• Trends in sale of large scale or destructive fishing • Gear (e.g. purse-seine, bottom trawlers) • Trends in area covered by trawlers • Trends in frequency of Trawling	3 years
			Trends in sustainable fishing practices	Trends in certification of fish produce	Annual
15.1 15.5	6. Ecologically representative areas on land and in inland waters, as well as coastal and marine zones, especially those of particular importance for species, biodiversity and ecosystem services, are conserved effectively and equitably, on the basis of PA designation and management and other area-based conservation measures and are integrated into the wider landscapes and seascapes, covering over 20 per cent of the geographic area of the country, by 2020	10, 11,12	Trends in PA coverage under four legal categories (National Park, Wildlife Sanctuary, Community Reserve and Conservation Reserve)	Change in no./area/percentage of PA over time	3 years
			Trends in other area-based conservation measures	Area/no.of initiatives	3 years
			Trends in coverage under Biodiversity Heritage Sites (BHS) under the Biological Diversity Act 2002	Change in number/area/percentage of BHSs over time	3 years
			Trends in wetlands brought under integrated management	• Changes in area and ecological status of wetlands through implementation of integrated management plans • Changes in abundance and diversity of waterbird species in wetlands over time • Trends in coverage of sites of international importance for migratory species under CMS	3 years
			Trends in Important Bird Areas (IBAs)	Changes in number/area of IBAs over time	3 years
			Status and population trends of 16 IDWH terrestrial species and habitats	Population trends of selected species	5 years
			Trends in forest cover in four designated categories	Changes in proportions of forest cover in differentforest categories (VDF, MDF, OF, Scrub	2 years

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			Trends in status of Indian plant and animal species included in International Union for Conservation of Nature (IUCN) Red Data Book	Conservation status of species, subspecies and varieties and even selected subpopulations at a national scale highlighting taxa threatened with extinction and therefore promoting their conservation	4 years
			Status of ecosystem services of selected ecosystems	Status of ecological services of selected ecosystems including agricultural landscapes	5 years
15.1	8. By 2020, ecosystem services, especially those relating to water, human health, livelihoods and wellbeing, are enumerated and measures to safeguard them are identified, taking into account the needs of women and local communities, particularly the poor and vulnerable sections.	14	Level of toxic contaminants in wetlands/rivers/aquatic fauna	• Trends in pollution status of wetlands of international (Ramsar sites) and national identified by state governments) importance • Levels of toxic contaminants in rivers that provide freshwater for human use • Levels of toxic contaminants in aquatic/terrestrial fauna	2 years
			Extent of restored forest cover in India	• Trends in area of forests under restoration • Trends in area under plantations in rural/urban areas • Trends in very dense forest/moderately dense forest in PAs	2 years
			Trends in wetlands significant for delivering freshwater being brought under integrated management	Area of wetlands such as lakes and ponds under integrated management	3 years
15.6	9. By 2015, Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their utilisation as per the Nagoya Protocol are operational, consistent with national legislation.	16	Trends in access to genetic resources and equitable sharing of benefits	• Trends in number of proposals for intellectual property rights • Trends in number of cases seeking third party transfer for accession of biological resources and associated Traditional Knowledge (TK) • Trends in number of cases seeking prior approval of NBA for transferring the results of research to • foreign nations, companies and NRIs for commercial purposes • Trends in number of cases seeking approval of use of bio-resources and associated TK for commercial utilisation	3 years
15.9	10. By 2020, an effective, participatory and updated national biodiversity action plan is made operational at different levels of governance.	3 , 4, 17	Progress in implementing NBAP	• Trends in preparation of State Biodiversity Action Plans (SBAPs) • Trends in implementing the activities envisaged under SBAPs	3 years
15.a 15.b	12. By 2020 opportunities to increase availability of financial resources for effective implementation of Startegic Plan for Biodiversity 2011-2020	19, 20	Trends in financial resources available for implementing Aichi Targets		3 years

Source: Compiled by Authors.

Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss: Targets and Indicators	
15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	15.1.1 Forest area as a proportion of total land area 15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type
15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	15.2.1 Progress towards sustainable forest management
15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world	15.3.1 Proportion of land that is degraded over total land area
15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development	15.4.1 Coverage by protected areas of important sites for mountain biodiversity 15.4.2 Mountain Green Cover Index
15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species	15.5.1 Red List Index
15.6 Promote fair and equitable sharing of the benefits arising from the utilisation of genetic resources and promote appropriate access to such resources, as internationally agreed	15.6.1 Number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits
15.7 Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products	15.7.1 Proportion of traded wildlife that was poached or illicitly trafficked
15.8 By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species	15.8.1 Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species
15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts	15.9.1 Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020
15.a Mobilise and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems	15.a.1 Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems
15.b Mobilise significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation	15.b.1 Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems
15.c Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities	15.c.1 Proportion of traded wildlife that was poached or illicitly trafficked

16
Peace, Justice and Institutions to Ensure "No One is Left Behind"

Introduction

Human development is not a contested idea. From the local municipal councillor to the Member of Parliament espousing it, to policy practitioners and activists interested in measuring and refining its indices, to the United Nations where heads of states collectively agree to articulate its fundamentals and chart progress towards the same, change-makers have championed achieving better and more holistic human development. In this, the United Nations has played a key role in bringing to the centre stage human development by articulating that development is more than just measuring economic growth but also about ensuring people choices that transcend mere basics of good health, education and decent quality of life to substantives such as political freedoms, human rights and respect as outlined in the first Human Development Report in 1990.

A decade later, the UN Millennium Declaration united heads of states in making a pact to adopt human development as the key premise that would be foregrounded on principles of freedom, equality, solidarity, tolerance, respect for nature and shared responsibility. A critical milestone in the journey of advancing towards better and more holistic human development, the Declaration enshrined at its core, fundamentals of "dignity, equality and equity at a global level" (UN, 2000). It also gave birth to the Millennium Development Goals (MDGs) – a set of eight international goals applicable globally – that were adopted in 2000 by 193 countries with a promise to attain these goals by 2015. While the MDGs succeeded in unifying the measurement of human development, it had its own set of limitations.

As the United Nations completes 70 years in 2015, over 160 Heads of State and Government, together with leaders of civil society and other key stakeholders adopted the new set of global Sustainable Development Goals (SDGs). Termed as the 2030 Agenda for Sustainable Development, these global commitments will replace the Millennium Development Goals (MDGs), and usher in a new development paradigm; one that would be equally applicable to the developing and developed countries, and address the three interconnected elements of sustainable development – economic growth, social inclusion and environmental sustainability. Given India's rather tepid success with the MDGs, it is critical to flag some fundamental concerns for the new development agenda to ensure "no one is left behind". Tables 1 to 3 provide a global overview of the performance across select development indicators.

The set of 17 SDGs along with their 169 targets and attendant indicators commit to close the gap in terms of the unfinished MDG agenda, make additional commitments to address the fundamental challenges to attainment of human development that entailed more sustained global collaboration, and finally provide for critical 'enabling' goals as the drivers of change to ensure sustainable development for all. Goal 16, titled, *"Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels"*, falls in the category of an "enabling" goal. The present paper scrutinises specific aspects of Goal 16 with a view to assess how enabling are its provisions to ensure that the basic premise of the SDGs to "leave no one behind" is realised.

The paper is organised in four sections: after setting the context, the first section provides a critique of the newly-adopted SDGs and their underlying framework. The second section frames Goal 16 as an enabling goal and examines some of the specific aspects that determine its role as an "enabler". The third section looks at specific indicators within Goal 16 and points to critical focus areas from the Indian perspective. The fourth and final section presents the road ahead in terms of processes and avenues for engagement.

The 2030 Agenda for Sustainable Development: An Overview

With an aspiration to define the agenda for global action for the next fifteen years, the final Outcome Document presents the set of SDGs and attendant targets along with a theoretical underpinning to have a set of universal, transformative goals aiming to 'leave no one behind'. The document attempts to address the longstanding criticism of the Millennium Development Goals (MDGs) by foregrounding the proposed SDGs with a preamble, shared principles and a vision for transforming the world. Four overall observations foreground our assessment of the Outcome Document.

Firstly, while set within a largely rights-based frame, concerns around the broader political underpinnings in terms of the declining role of the state vis-à-vis the private sector and businesses continue to dominate. With increasing references to the necessary partnerships between the state and other stakeholders, primarily the businesses, the private sector and philanthropies, there is growing concern that the new framework will remain more about encouraging these partnerships without addressing the systemic, deep-rooted developmental challenges confronting most parts of the world today.

In this regard, the 2015 Human Development Report presents findings of peoples' perceptions across 190 countries around key concerns such as feeling safe, trust in national government and trust in judicial system (Table 4). While South Asia tops across all regions in terms of perception of level of trust in the national government and judicial system, it is revealing that when queried about overall life satisfaction, South Asia is second-lowest (better only to Sub-Saharan Africa) while Latin America rates the highest.

More so, with evidence of growing inequality within and across countries, and the increasing voice of civil society to address this widening chasm between the handful of wealthy and the increasing majority of most marginalised, the new development agenda will need to focus most of all on the ambition to bring to centre stage the concerns of the most excluded, the most marginalised before cementing newer partnerships without elements of adequate regulation, scrutiny and accountability mechanisms. To illustrate, Table 5 compares incidence of poverty, extreme poverty and inequality in India from 1993 to 2011 and finds that although extreme poverty (and poverty) is on the decline, it has not led to closing the gap in terms of widening inequalities; the gap between the income share held by the highest 20 per cent and the lowest 20 per cent has only widened during this period.

Table 1: Region-wise Population and GDP Per Capita

Region	Total Population (millions)		GDP per capita (PPP$)	
	1999	2014	1999	2014
Arab States	240.7	373.1	4,550	15,722
East Asia and the Pacific	1,839.8	2,051.5	3,950	11,449
Europe and Central Asia	398.3	234.9	6,290	12,791
Latin America and the Caribbean	494.0	618.0	6,880	14,242
South Asia	**1,377.6**	**1,771.5**	**2,280**	**5,605**
Sub-Saharan Africa	591.3	911.9	1,640	3,363
World	**5,862.7**	**7,243.8**	**6,980**	**14,301**

Source: Human Development Reports 2001 and 2015, United Nations Development Programme.

Table 2: Region-wise Performance on Key Development Indicators (1999 – 2014)

Region	Human Development Index (HDI 1999)	Human Development Index (HDI 2014)	Life Expectancy Index (1999)	Inequality-adjusted Life Expectancy Index (2014)	Education Index (1999)	Inequality-adjusted Education Index (2014)	GDP Index (1999)	Inequality-adjusted Income Index (2014)	Gender Inequality Index (2014)
Arab States	0.64	0.68	0.69	0.64	0.62	0.33	0.64	0.62	0.53
East Asia and the Pacific	0.71	0.71	0.74	0.73	0.81	0.49	0.61	0.52	0.32
Europe and Central Asia	0.77	0.74	0.73	0.69	0.91	0.65	0.69	0.61	0.30
Latin America and the Caribbean	0.76	0.74	0.74	0.73	0.83	0.52	0.71	0.48	0.41
South Asia	**0.56**	**0.60**	**0.63**	**0.56**	**0.54**	**0.28**	**0.52**	**0.49**	**0.53**
Sub-Saharan Africa	0.46	0.51	0.40	0.37	0.54	0.28	0.47	0.38	0.57
World	**0.71**	**0.71**	**0.70**	**0.65**	**0.74**	**0.44**	**0.71**	**0.57**	**0.44**

Source: Human Development Reports 2001 and 2015, United Nations Development Programme.

Table 3:Region-wise Performance on Key Indicators of Financial Flows (1990, 1999, 2013)

Region	Foreign Direct Investment Net Inflows (% GDP)			Net Official Development Assistance Received (% GDP)			Private Capital Flows (% GDP)		
	1990	1999	2013	1990	1999	2013 (% GNI)	1990	1999	2013
Arab States	0.7	0.3	1.7	-	-	0.9	-0.1	0.3	2.0
East Asia and the Pacific	1.6	3.0	3.6	0.8	0.5	0.1	0.7	-0.2	-2.4
Europe and Central Asia	-	2.9	2.7	-	-	0.6	-	0.9	-4.0
Latin America and the Caribbean	0.7	4.5	3.5	0.4	0.2	0.2	0.3	1.1	-4.3
South Asia	**-**	**0.5**	**1.3**	**1.1**	**0.6**	**0.5**	**0.4**	**-0.3**	**-1.7**
Sub-Saharan Africa	0.3	2.4	2.4	-	-	3.0	0.2	0.8	-3.4
World	**-**	**-**	**2.3**	**-**	**-**	**0.4**	**-**	**-**	**-0.9**

Source: Human Development Reports2001 and 2015, United Nations Development Programme.

Table 4:Region-wise Perception Assessment on Key Aspects of Human Development, 2014

Region	Perceptions of individual well-being (2014)		Perceptions of work and labour market (2014)		Perceptions of government (2014)	
	Feeling safe (% answering yes)	Overall life satisfaction index (0, least satisfied to 10, most satisfied)	Ideal job (% answering yes)	Feeling active and productive (% answering agree to strongly agree)	Trust in national government (% answering yes)	Confidence in judicial system (% answering yes)
Arab States	66	5.0	53	41	-	-
East Asia and the Pacific	-	-	-	-	-	-
Europe and Central Asia	62	5.3	56	42	46	35
Latin America and the Caribbean	43	6.5	74	-	35	35
South Asia	**55**	**4.5**	**81**	**49**	**69**	**66**
Sub-Saharan Africa	51	4.3	52	50	50	47
World	**62**	**5.3**	**71**	**52**	**54**	**54**

Note: All perceptions are responses to specific questions as part of the Gallup World Poll 2014. For more information, please see: http://www.gallup.com/poll/180374/gallup-top-world-findings-2014.aspx

Source: Human Development Report 2015, United Nations Development Programme.

Table 5: Poverty and Inequality in India Over the Years

	Indicators	1993	2004	2009	2011
Extreme Poverty	Number of poor at national poverty line (millions)	418.8	419	361.8	273.2
	Poverty headcount ratio at national poverty lines (% of population)	45.3	37.2	29.8	21.9
	Number of poor at $1.90 a day (2011 PPP) (millions)	424.2	432.1	378.3	259.5
	Poverty headcount ratio at $1.90 a day (2011 PPP) (% of population)	46.1	38.4	31.4	21.3
Poverty	Number of poor at $3.10 a day (2011 PPP) (millions)	734	826	817.8	708.3
	Poverty headcount ratio at $3.10 a day (2011 PPP) (% of population)	79.7	73.4	67.9	58
Inequality	Income share held by highest 20%	40.1	42.4	42.8	44.2
	Income share held by fourth 20%	21.5	21	20.8	20.5
	Income share held by third 20%	16.5	15.8	15.7	15.2
	Income share held by second 20%	12.8	12.2	12.1	11.8
	Income share held by lowest 20%	9.1	8.6	8.5	8.2

Source: World Development Indicators and Poverty and Equity Database, World Bank Accessed on 29/12/2015.

For instance, under Means of Implementation and Global Partnership (paras 39 to 46), there is a clear push towards promoting private finance without adequately recommending better, transparent and global systems of progressive taxation that revitalise the role of the state and ensure that financing for critical developmental needs is not dependent on the new partnerships alone.

Secondly, when seen from a developing South perspective, the 2030 Agenda document still seems to be tepid in terms of addressing specific concerns of the global South. Be it inclusion and active engagement in the global decision making processes such as reforms of the international financial institutions or shaping the global development agenda incorporating the lens of the most marginalised and the excluded.

While the principle of 'leave no one behind' finds mention in the Preamble and the subsequent paras, the language of many of the targets has been significantly watered down. For instance, the mainstreamed Means of Implementation (MOI) targets within the 16 proposed SDGs remain mostly recommendatory in tenor and still do not spell out concrete commitments that the developed countries will adhere to.

The principle of common but differentiated responsibility (CBDR) that finds a solo mention under our shared principles and commitments (para 12, page 5) remains critical as a principle for climate financing as well as for specific MOI for SDGs 1, 7, 10, 12 and 13. A significant bone of contention from the very start of the negotiations process, there is a need to elaborate on the application of the principle within specific goals and attendant targets and not restrict it to just a passing mention.

Within the standalone MOI goal (SDG 17) to realise the 2030Agenda, while technology facilitation mechanism is being regarded as a key driver to re-balance the South-North dichotomy, there is a need to examine the mutually supporting elements – such as world trade, monetary and financial systems, and strengthened and enhanced global economic governance – more closely. The emphasis on technocratic solutions for community-based challenges might be lopsided; solutions in terms of facilitation mechanism need to be embedded more at the community level than only limited to the scientific and technocratic community level.

Under systemic issues (policy and institutional coherence) 17.13, the document would have been made more substantive by addressing challenges of global coordination around issues of fair and progressive taxation. There seems to be almost no reference to the need to address the challenges of tax havens, tax revenue foregone due to exemptions, tax holidays, tax evasion and avoidance, tax treaties and reporting of tax and beneficiary ownership that collectively create opaque systems that are already riddled with poor governance structures. In the context of magnitude of illicit financial flows from developing countries and the attendant loss of income, this is a critical miss. Kar and Spanjers (2015) find that illicit financial flows account for an annual loss of over US$ 1 trillion from developing (poor) countries (Table 6).

Fourthly, it is welcome to note a section devoted to identifying possible follow up and review mechanisms. In the present political context where we see the shrinking space for civil society engagement and leadership in shaping the developmental policies and national priorities, the treatise for the new development agenda must shoulder the role of chaperoning and firmly reinstating the role of civil society as a natural ally to promoting social policy change and a voice of dissent that is critical and enabling for more effective and meaningful democratic decision-making processes. In this regard, the UN system and inter-agencies must strongly push for the role of civil society organisations (CSOs) and other key stakeholders and rights-based activists in participation of the feedback mechanisms. If the role of monitoring is reduced to a cursory review conducted by the government, it would only ensure availability of regular updates on progress (based on questionable assessment metrics) without the actual insights from the communities that are most vital to mapping change.

Before exploring the next steps in terms of follow up, review and monitoring in greater detail in the concluding section of this paper, the following section undertakes an extensive study of Goal 16 as an "enabler" to realisation of the SDGs.

Framing Goal 16 as an "Enabling" Goal

Among the 17 SDGs, there are a few, such as Goals 10, 12, 16 and 17, that are enabling in their articulation.

Table 6: Illicit Financial Flows from Developing Countries, by Region, 2004-13 (amount in billions of US$, nominal)

Regions	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Average Share (in %)
Sub-Saharan Africa	32.5	51.9	56.4	77.0	78.6	85.0	78.0	74.3	66.7	74.6	8.6
Asia	174.6	191.9	209.1	236.5	277.5	277.1	381.7	361.1	456.7	482.0	38.8
Developing Europe	107.3	118.4	133.8	190.6	233.8	204.9	221.8	295.5	242.5	250.4	25.5
MENA-AP	29.9	31.0	33.3	57.4	80.3	51.9	53.0	81.1	68.2	70.3	7.1
Western Hemisphere	120.9	131.4	111.0	137.7	157.8	128.1	172.0	195.8	201.8	212.8	20.0
All Developing Countries	465.3	524.6	543.5	699.1	828.0	747.0	906.6	1007.7	1035.9	1090.1	

Source: Kar and Spanjers (2015).

These goals, it is expected, would act as catalysts in promoting and sustaining human development. In some senses, Goal 16 is largely about promoting justice-based governance, be it in its emphasis on promoting peaceful and inclusive societies and access to justice as pre-conditions to ensuring accountable and inclusive institutions, or a clear proposal to build an integrated institutional apparatus to address challenges of lack of accountability, transparency and participation. More particularly, the attention to global governance challenges such as illicit flows (financial and weapons), tax systems and corruption is critical.Thus, Goal 16 proposes to address specific aspects of justice-based governance[1] to enable realising sustainable development for all.

As is well-known, "governance" refers to decision-making by a range of interested people, or stakeholders, including those in positions of power and citizens (Brody, 2009). While in principle, it is agreed that all stakeholders are equal and get an equal say in the decision-making processes, in reality, not all stakeholders have the required power to influence decisions and hold decision-makers to account. A more-commonly used term, 'good' governance, goes beyond governance to assess the quality of decision-making processes judged against accepted governance standards.

However, it has been critiqued for its limitations in terms of who decides what constitutes good governance; whether those making the judgements are leading by example and being accountable for their own governance processes — and whether the way they assess the effectiveness of governance adequately captures the complexity and sometimes contradictory nature of local cultural, social and political contexts (Pettai and Illing, 2009). The increasing emphasis on governance in the developing countries of the South also stemmed from donors' perspective to viewing governance failures as manifesting in poverty. It is also argued that this focus on 'good' governance, especially by the World Bank, was to shift focus from the failures of the Structural Adjustment Policies (SAP) in the 1980s.

A crucial missing aspect is a rights-based governance framework and linking the national discourse to international conventions with a broad agreement on how to operationalise this. When we arrive at the issue of operationalising governance processes and structures, a key element for consideration is the extent of decentralisation of decision-making that allows for quicker decisions, making decisions more locally-relevant, transparent and accountable.

Another important metric to gauge the extent of sustainable development in societies is prevalence of

peace and non-violence. The myriad forms of violence and exploitation meted out on the most disadvantaged in the communities reflects the lack of institutional safeguards in the form of legislations and enforceable policies. Linked to this is the need to focus on ensuring access to justice for all. This is again crucial given the changing contexts in most countries where fundamental freedoms such as freedom of speech and to dissent are under threat. With increasing globalisation, there is need to focus on challenges confronting the refugees and migrants forced out of their countries due to war, unrest and natural calamities.

Contrary to commonly-held perceptions, it is not only governments that make decisions that affect ordinary citizens' lives; global governance institutions such as the World Bank (WB) and the World Trade Organisation (WTO) also make decisions, which influence the national governments. In turn, CSOs and citizens play a key role – putting pressure on governments to take action to challenge inequalities, and holding them accountable for the commitments they make. Five interconnected levels of governance have been identified – the household, community, local and national government, and global institutions. These governance institutions are becoming more and more interlinked.

Decisions made at a global level increasingly influence our lives – for example, tax systems and international taxation agreements have significant implications on national tax policies and indirectly influence creation and strengthening of parallel economies. Similarly, despite a lot of civil society pressure, most of the budget information in the country still remains off-limits to the ordinary citizen. This is vital because an informed, vigilant citizenry would be better able to question the policy priorities of the government and seek accountability.

How "Enabling" is Goal 16?

Having reviewed the centrality of Goal 16 to "enabling" a sustainable development frame that is substantive and people-centric, it is worthwhile to understand how "enabling" the existing provisions are. SDG 16 subsumes ten targets and two Means of Implementation targets. There are a total of 23 attendant indicators that have been finalised through several rounds of review and consultations.

Goal 16 can be broadly broken down into four parts, i.e. targets specific to peaceful societies; access to justice; national efforts needed to building effective, accountable and inclusive institutions; and international cooperation towards building accountable institutions at all levels. As previously discussed, all of these form critical enablers to promoting justice-based governance systems that are people-centric and non-discriminatory (see Table 7).

The indicator framework would be crucial for measuring progress on the targets set. Reporting of conflict-related deaths and documenting instances of sexual violence are most-needed. Similarly, the urgency to throw open the Pandora's Box of corruption and bribery by documenting instances needs to be underscored. Ranking very high as one of the enablers of a progressive rule of law and justice system is ensuring killing and torture of human rights advocates, activists and journalists is checked. Finally, while discussing global governance systems and cooperation across regions, a vital aspect exacerbating inequality are the unchecked illicit financial flows (inward and outward) between countries.

Road Ahead for India

In conclusion, it is critical for governments and the UN system to define and create awareness of the processes that will succeed the long chain of consultative and, at times, seemingly disconnected, processes that led to adoption of the SDGs.

Beginning with the High Level Panel's submission to the UN Secretary General (SG) and its subsequent incorporation into the UN SG's Report, along with inputs from the Sustainable Development Solutions Network, Global Compact, My World Survey, thematic, regional and national consultations held globally, ongoing recommendations from the Open Working Group on Sustainable Development Goals, all of which coalesced into the 70th UN General Assembly adoptingthe SDGs, it has been a long journey.

SDG 16 speaks of peaceful and inclusive societies, access to justice for all, effective and accountable institutions at all levels. Given India's initiatives in this regard – be it on inclusiveness (special schemes and programmes for women, Dalits and Adivasis), decentralisation (implementation of 73rd and 74th amendments of the Indian Constitution), or putting

Table 7: Broad Classification of Targets and Indicators of Goal 16

Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	
Broad Classification	**Targets**
Peaceful Societies	16.1 Significantly reduce all forms of violence and related death rates everywhere
	16.2 End abuse, exploitation, trafficking and all forms of violence against and torture of children
Access to Justice	16.3 Promote the rule of law at the national and international levels and ensure equal access to justice for all
	16.9 By 2030, provide legal identity for all, including birth registration
National efforts to building effective, accountable and inclusive institutions	16.5 Substantially reduce corruption and bribery in all their forms
	16.6 Develop effective, accountable and transparent institutions at all levels
	16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels
International cooperation for building effective, accountable and inclusive institutions	16.4 By 2030, significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organised crime
	16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels
	16.8 Broaden and strengthen the participation of developing countries in the institutions of global governance
	16.10 Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements
	16.a Strengthen relevant national institutions, including through international cooperation, for building capacity at all levels, in particular in developing countries, to prevent violence and combat terrorism and crime
	16.b Promote and enforce non-discriminatory laws and policies for sustainable development

Source: Based on the author's analysis of the SDG 16, its attendant targets and indicators.

in place decentralised institutional apparatus for legal services – it is an opportunity for the government to strengthen some of these while giving more attention to concerns specific to accountability.

Some of the recent noteworthy initiatives of the government worth mentioning are the Digital India campaign (focussed on providing e-governance solutions for citizen-centric projects)[2], the Pragati platform (which is an IT-based redressal and monitoring system)[3], and the Right to Information legislation. In this regard, the NITI Aayog[4] has identified three Centrally-Sponsored Schemes (CSS) that would be monitored to ensure effective implementation of SDG 16. These include: Panchayat Yuva Krida aur Khel Abhiyan (PYKKA)[5], Development of Infrastructure Facilities for Judiciary including Gram Nyayalayas (for setting up a new tier of courts – the Gram Nyayalayas - providing quick and inexpensive access to justice to citizens)[6] and the Integrated Child Protection Scheme.[7] However, needless to add, it is also vital that over and above these provisions, the government must put in place effective safeguards to ensure vibrant and accountable governance systemsat all tiers (national and sub-national) to realise SDG 16.

While human development might not be a contested idea, the ways to attain it remain contentious with divergent perspectives and approaches guiding the discourse. From the experience of Indian civil society's engagement in influencing the post-2015 development agenda that advocates for a pro-poor, pro-human rights agenda of development and having reviewed the frame underpinning the MDGs, it is critical to underscore that the 2030 Agenda must address and eliminate the fundamental concerns of exclusion, discrimination and injustice to ensure justice, social inclusion and sustainabledevelopment for all. The SDGs must also aim to realise the promise made in the UN Charter and subsequently in the UN Millennium Declaration to secure dignity and human rights for all.

Endnotes

1 A previous and more-detailed analysis and commentary on the principle of 'just' governance by the author can be accessed here: http://wadanatodo.net/documents/outputs/mdgs/4%20Just%20Governance.pdf

2 http://digitalindia.gov.in/content/about-programme

3 http://pib.nic.in/newsite/PrintRelease.aspx?relid=117685

4 http://niti.gov.in/mgov_file/Draft%20Mapping-SDGs%20V15-200116.pdf

5 http://pib.nic.in/newsite/PrintRelease.aspx?relid=123456

6 http://www.swaniti.com/wp-content/uploads/2014/05/Development-of-Infrastructure-Facilities-for-Judiciary-including-Gram-Nyayalayas_v1-1.pdf

7 http://cara.nic.in/writereaddata/uploadedfile/NTESCL_635761170436561995_final_icps.pdf

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Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels : Targets and Indicators	
16.1 Significantly reduce all forms of violence and related death rates everywhere	16.1.1 Number of victims of intentional homicide per 100,000 population, by sex and age
	16.1.2 Conflict-related deaths per 100,000 population, by sex, age and cause
	16.1.3 Proportion of population subjected to physical, psychological or sexual violence in the previous 12 months
	16.1.4 Proportion of population that feel safe walking alone around the area they live
16.2 End abuse, exploitation, trafficking and all forms of violence against and torture of children	16.2.1 Proportion of children aged 1-17 years who experienced any physical punishment and/or psychological aggression by caregivers in the past month
	16.2.2 Number of victims of human trafficking per 100,000 population, by sex, age and form of exploitation
	16.2.3 Proportion of young women and men aged 18-29 years who experienced sexual violence by age 18
16.3 Promote the rule of law at the national and international levels and ensure equal access to justice for all	16.3.1 Proportion of victims of violence in the previous 12 months who reported their victimization to competent authorities or other officially recognized conflict resolution mechanisms
	16.3.2 Unsentenced detainees as a proportion of overall prison population
16.4 By 2030, significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime	16.4.1 Total value of inward and outward illicit financial flows (in current United States dollars)
	16.4.2 Proportion of seized small arms and light weapons that are recorded and traced, in accordance with international standards and legal instruments
16.5 Substantially reduce corruption and bribery in all their forms	16.5.1 Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months
	16.5.2 Proportion of businesses that had at least one contact with a public official and that paid a bribe to a public official, or were asked for a bribe by those public officials during the previous 12 months

16.6 Develop effective, accountable and transparent institutions at all levels	16.6.1 Primary government expenditures as a proportion of original approved budget, by sector (or by budget codes or similar)
	16.6.2 Proportion of the population satisfied with their last experience of public services
16.7 Ensure responsive, inclusive, participatory and representative decision-making at all levels	16.7.1 Proportions of positions (by sex, age, persons with disabilities and population groups) in public institutions (national and local legislatures, public service, and judiciary) compared to national distributions
	16.7.2 Proportion of population who believe decision-making is inclusive and responsive, by sex, age, disability and population group
16.8 Broaden and strengthen the participation of developing countries in the institutions of global governance	16.8.1 Proportion of members and voting rights of developing countries in international organizations

17
Means of Implementation: An Indian Perspective

Introduction

The Special Session of the UN General Assembly in September 2015 endorsed the 2030 Agenda for Sustainable Development, widely regarded as the Post 2015 Development Agenda. World leaders have already pledged their commitments to this agenda. India is a serious partner and as owned up to this agenda. This agenda comprise the Sustainable Development Goals (SDGs) which is a set of 17 goals and 169 targets integrated and indivisible in the universal sense. The SDGs are slated to be built upon the Millennium Development Goals (MDGs) which were adopted in 2000 as a set of eight goals on diverse dimensions with most direct relevance to welfare, development and sustainable use of resources globally.

This new agenda has an explicit focus on Means of Implementation documented separately in the proposed declaration. To draw up a solid roadmap on means of implementation, these have been recognised under each of the SDGs and as the final goal by itself (Goal 17) with specific targets addressing the following issues: finance, technology, capacity building, trade and systemic issues. While Goal 17 talks about the national policy space, the global agenda to strengthen means of implementation receives overwhelming attention. World leaders this time under this new agenda have pledged a high level of commitment in terms of a meaningful global partnership in support of implementation of all the Goals and targets, bringing together Governments, the private sector, civil society, the United Nations system and other actors and mobilising all available resources. India has supposedly been actively involved in the negotiations of the Goal 17 (on means of implementation and global partnership) to champion a leadership position among developing countries, and on purpose. India strongly supports an agenda of progressive reforms of the global institutional architecture governing economics, technology and environment. The world has already experienced shifting of the global centre of gravity from North towards South in several areas. In this paper we explore India's possible future strategy to achieve the SDGs and the role it might play in global governance architecture on some of the issues mentioned above.

Transition from MDGs to SDGs: Global Partnership Issues

The MDGs encapsulated eight globally agreed goals in the areas of poverty alleviation, education, gender equality and empowerment of women, child and maternal health, environmental sustainability, reducing HIV/AIDS and communicable diseases, and building a global partnership for development. The MDGs were to exhaust its time period in 2015 and hence the relevance of a new agenda and a new set of goals. The MDGs were meant to eliminate extreme poverty and deprivation and ensure sustainable use of energy and water under a fruitful global partnership that could facilitate this process. The UN system was at the forefront for initiating the MDG process and ensuring adoption of the MDGs in the developing world and in the relatively poorer countries. However, SDGs has been an outcome of an intensely negotiated process at the UN by all member states since 2012, since world leaders pledged to a new development round post-2015 at the Rio+20 conference.

The SDGs are much expanded compared to the MDGs and covers all three dimensions – social sector development, economy and sustainability across 17 goals. This has lead to views suggesting SDGs to be overly ambitious. The 2030 Agenda for Sustainable Development promises to connect 5 Ps – People, Planet, Prosperity, Peace and Partnership. The SDGs are universal, integrated and interlinked, and pledges to leave no one behind. While, the first set of the SDGs (1-7) may be an extension of the MDGs with a more comprehensive mandate of mitigating developmental challenges in key sectors in all their forms, the later goals could be referred to an extension of the agenda itself. These in turn have two distinct characters. Those immediately following the first 7 goals (8, 9 and 10) are referred to as enablers of development covering areas like inclusiveness and jobs, infrastructure and industrialisation, and distribution. The final set of goals under the SDGs (11-17) lays down the framework for sustainability covering areas like urbanisation; consumption and production; climate change; resources and environment; peace and justice; and means of implementation and global partnership. However, the two final goals are sometimes referred to as meta-goals as they set the preconditions for every other goal.

MDG 8 that rightly focussed on global partnership failed to adequately promote human development within the global economy given highly skewed global governance architecture on trade, finance and technology. Therefore, at the conceptual and operational level SDGs may not merely be an extension of the 8 MDGs, but are slated to focus on global systemic reforms to remove main impediments to development and secure an accommodating international environment for sustainable development. In this direction, the Third International Conference on Financing for Development (FfD3) at Addis Ababa, Ethiopia (13-16 July 2015) as mandated by the UN General Assembly has been much timely as it rightly prioritised the most crucial issue, i.e. financing of development ahead of the formal adoption of the Post-2015 Agenda and the SDGs. The FfD3 was also perceived to be much important prior to the UN Climate Change Conference in Paris (COP21), in December 2015. The FfD3 concluded with the Addis Ababa Action Agenda which is now considered integral to the 2030 Agenda for Sustainable Development.

While implementation of the SDGs rests with individual countries, the developing world must have access to adequate resources. Fulfilment of objectives under this agenda may be critically hinged on successful North-South Partnership and South-South Cooperation. For obvious reasons, SDGs are unique for having accommodated much larger spectrum of views and concerns of the developing world and is mandated to be a universal agenda with obligations for both the developed and the developing countries. The process per force necessitates national ownership of this agenda towards its fulfilment in the next 15 years. G77, China, India and some of the other emerging counties have taken an active part in the negotiations around the Post 2015 Development Agenda and have vehemently highlighted the importance of finance and technology for successful delivery of a global development agenda. We discuss the two issues in some detail.

Financing Development, Domestic Resource Mobilisation and Global Tax Issues

Limits to Financing Development through Aid

Availability of long term finance for development from a global perspective is a key issue.[1] Long term finance for development is essential for rapid progress in achieving key developmental goals and targets universally. The conventional sources of finance supporting private interest driven economic activities is not expected to serve these ends. Raising capital or savings for investment in the social sector is particularly difficult unless mediated and therefore, developing countries and least developed countries are at serious disadvantage in this regard.[2]

The decline in Official Development Assistance (ODA) in relative terms (as percentage of combined gross national income (GNI) of the Development Assistance Committee (DAC) member states) since 2011 has been a matter of grave concern. In 2011, members of the DAC of the OECD provided US$ 133.5 billion of net ODA, representing 0.31 per cent of their combined GNI. This was a 2.7 per cent drop in relative terms compared to 2010, the year it reached its peak. In 2012, DAC provided US$ 125.6 billion in ODA, representing 0.29 per cent of their combined GNI, again a 4 percent drop in relative terms compared to 2011.

In subsequent years, 2013 and 2014, the relative ODA from DAC has remained lower than the 2011 levels. For a major emerging economy like India, ODA from DAC members stands at 0.09 per cent of its GNI. India, thus, needs to mobilise resources through means other than ODA.

While this trend has been accentuated by the global economic and financial crisis, development in the South is critically linked with expansion of domestic capabilities including production capacities that depends on the availability of finance. The failure on the part of the developed countries to meet their own commitments that they had set for themselves under ODA should certainly be a disappointment for them; it nevertheless translates into tragedy for all those who depend on ODA. It has been highlighted that financing for development (which includes ODA) is distinct and should not be mixed with other areas of financial support for developing countries like climate financing and humanitarian aid. Moreover, the states have to come up with the resources needed for development and the private sector cannot fill in the gap. The FfD3 stressed upon unlocking of domestic finances, but did not fully succeed in bringing in new resources on table.

In the immediate neighbourhood i.e. South Asia, which shares bulk of developmental and sustainability challenges with India and suffers from gaps across indicators resource mobilisation has been a major challenge. Almost all economies in South Asia have been recipients of development aid for the last 50 years or so. The quantum varied over the years but has consistently gone up in almost all cases except for India, where it had declined in the recent past with India turning selective in accepting aid. India's Development Cooperation Policy underwent a major change in early 2000s. A minimum ceiling of US$ 25 million was set for incoming foreign aid to India. Only G-7 countries are left to provide aid. In 2016, India declined aid from UK too (Table 1). Countries in South Asia, however, differ greatly in terms of domestic resource mobilisation capacities. This is evident from the variety in terms of their dependence on ODA (Table 2).

Challenges to Domestic Resource Mobilisation

With paucity of funds for appropriate investments to enhance production capacities and capabilities that also include technology and human capital, economies of the South have failed to achieve their targets of industrialisation and development. Adequate capital and savings are important for expansion of productive capacities that is linked with expanding livelihood opportunities. This further leads to expansion of local markets and incentivises local production. Entrepreneurships in the small and medium industries segment may thrive with improvement in the economic opportunities of people in the developing countries. Developing countries still lack well developed financial markets and instruments to make private investments viable. Hence, domestic resource mobilisation emerges as a key challenge in developing countries, which necessarily impacts their development goals. Appropriate fiscal policies, therefore, become extremely important for facilitating revenue generation for financing capacity creation and development.

Developing countries continue to have very low tax to GDP ratios (avg. 12.5 percent). This ratio further falls when oil related revenues are considered separately. There is widespread black money in developing countries generated not only through money laundering but also through over-invoicing and under-invoicing rampant in business transactions. India has been at a disadvantageous position with respect to containing black money. However, there are more complex issues that seriously handicap the domestic resource mobilisation capabilities of developing countries. These are: profit shifting practices of multinationals and inability to tax capital gains.

Therefore, the threefold challenge to domestic resource mobilisation in developing countries is:

- Illicit financial flows (black money generated through money laundering, and adverse practices in financial transactions e.g. over/under invoicing)
- Transfer pricing practices of multinational businesses
- Inability to tax capital gains with cross border asset ownership

While under the FfD3 process proactive efforts have been made to address the issues of domestic resource mobilisation in poor countries and strengthen their domestic revenue generation capacities to check illicit flows[3], the global community has been oblivious of the vast amount of resources that are leaking out of the developing countries in the form of tax evasion under profit shifting practices. It has sometimes been

Table 1: Aid Inflow in South Asia (US$ Million, constant 2012 prices)

Country	Year	1990	1995	2000	2005	2010	2013
Afghanistan	Net ODA	192.16	294.45	234.98	3314.53	6684.83	5369.93
	Per cent of Net Loan in Net ODA				4.16	-0.12	0.19
	Per cent of Loan Repayments in Net ODA	9.86	0.03		0.13	0.01	0.32
Bangladesh	Net ODA	3364.49	1688.93	1785.62	1553.71	1474.38	2722.26
	Per cent of Net Loan in Net ODA	51.18	23.61	32.57	34.89	8.26	42.18
	Per cent of Loan Repayments in Net ODA	5.74	23.97	36.60	34.16	48.84	29.84
Bhutan	Net ODA	75.55	88.53	87.37	110.3	137.94	138.37
	Per cent of Net Loan in Net ODA	13.32	7.76	18.95	20.88	32.80	20.58
	Per cent of Loan Repayments in Net ODA	1.84	0.81	4.45	2.83	5.65	5.93
India	Net ODA	2227.66	2120.42	1966.23	2165.77	2946.68	2546.74
	Per cent of Net Loan in Net ODA	38.67	36.71	41.87	24.79	54.63	46.70
	Per cent of Loan Repayments in Net ODA	52.00	54.45	77.35	85.37	67.00	90.11
Maldives	Net ODA	33.21	73.3	29.15	94.09	116.18	23.42
	Per cent of Net Loan in Net ODA	19.30	43.10	8.10	20.60	57.23	4.87
	Per cent of Loan Repayments in Net ODA	12.07	5.80	16.47	6.82	8.93	46.75
Nepal	Net ODA	670.86	534.4	579.37	508.3	860.7	871.24
	Per cent of Net Loan in Net ODA	41.62	28.83	34.01	-4.19	2.14	5.83
	Per cent of Loan Repayments in Net ODA	2.90	9.98	14.11	16.51	16.39	19.23
Pakistan	Net ODA	1785.96	1007.01	977.03	1951.13	3144.45	2187.68
	Per cent of Net Loan in Net ODA	42.25	52.39	66.67	33.72	1.53	2.23
	Per cent of Loan Repayments in Net ODA	26.86	78.43	46.34	26.64	25.43	35.72
Sri Lanka	Net ODA	1163.46	662.47	385.53	1445.09	615.92	442.58
	Per cent of Net Loan in Net ODA	54.60	45.02	26.34	36.31	30.71	23.20
	Per cent of Loan Repayments in Net ODA	10.20	30.96	95.56	9.38	82.82	121.36

Note: Net ODA includes grants, capital subscriptions and net loans (loans extended minus repayments of loan principal and offsetting entries for debt relief). Percentage of Net Loan in Net ODA is calculated by the authors.

Source: RIS based on OECD database.

elaborated as manifestation of 21st century colonialism when resources are sucked out of the developing countries in the absence of prudent international taxation norms. The amount of development assistance flowing into the global South is much less than the quantum of profit shifting from developing and poor countries. This necessitates that countries of the South must get a share of the resources generated within their jurisdiction.

India has been foremost in highlighting the scale of revenue loss in developing countries on account of profit shifting practices of multinationals (transfer pricing) and inability to adequately tax capital gains under existing global norms. These are over and above all forms of illicit financial flows that keep substantial revenues out of the reach of the developing countries. UNCTAD's simulation indicates that the amount of

Table 2: Net ODA as Percentage of Central Government Expenditure

	2008	2009	2010	2011	2012
Afghanistan	95.08	113.30	79.68	65.22	79.92
Bangladesh	23.97	12.12	13.25	11.77	..
Bhutan	30.48	42.57	..	..	..
India	1.03	1.11	1.01	1.23	0.56
Maldives	9.33	4.85	16.82	7.21	..
Nepal	..	..	32.73	29.52	25.15
Pakistan	5.08	10.19	9.72	9.32	4.79
Sri Lanka	9.35	7.97	6.07	5.76	4.59

Source: WDI (2014).

corporate profits shifted from developing economies is about US$ 450 billion – implying, at a weighted average effective tax rate across developing countries at 20 per cent, annual tax revenue losses of some US$

90 billion (World Investment Report, 2015). Other relevant studies, focussing on the revenue losses for developing economies generated by corporate trade mispricing schemes, such as Christian Aid (2008) calculate such losses between US$ 120 billion and US$ 160 billion a year. Recovering some or all of these losses could significantly contribute to domestic resource mobilisation in developing countries.

Global Tax Issues

The FfD3 deliberation was significant in terms of articulating the need for a new global institution of norm setting on tax. Negotiations on all prevailing international tax norms involve a few countries of the Paris Club/OECD. The financing for development (FfD) is a process that has been pursued under the UN framework outside Washington after the Asian Financial Crisis. This gives a platform that governance ideas may emerge out of the UN system and recommendations are provided for institutions like the IMF as well as on substantive norm setting for ODA. Hence, the FfD process is sufficiently empowered to initiate a blueprint for new international tax architecture.

The Group of 77 and China has repeatedly called for the upgrade of the Committee of Experts on International Cooperation in Tax Matters, transforming it from experts acting in their own capacity, to an inter-governmental subsidiary body of the Economic and Social Council (ECOSOC), with experts representing their respective governments. This would go a long way in not only strengthening international cooperation in tax matters, but it would allow all member States, including developing countries, to have an equal say on issues related to tax as well. Not only did India engage proactively and productively in the negotiations on the Post 2015 Development Agenda and framing of the Sustainable Development Goals since 2012, India made effective contributions towards the final outcome in Addis Ababa, before the adoption of the Addis Ababa Action Agenda. While, the draft outcome of the FfD3 was largely sealed, India sought to make substantive changes under domestic resource mobilisation and international tax architecture.

The issue of increasing efforts to reduce illicit financial flows by 2030 and combating tax evasion through national regulations and international cooperation remained the cornerstone of the FfD3 negotiations. While the FfD3 agenda was promising in terms of international support for improving domestic revenue generation capabilities of poor countries, India with support from G77 and China proposed stronger international tax rules and advocated an intergovernmental tax body. This was proposed with the objective of creating an institution under the UN with larger participation of the developing world reflecting rising aspirations and capabilities of the South. The Addis Ababa Action Agenda calls for international cooperation to combat tax evasion and corruption to reduce opportunities for tax avoidance. This also includes steps towards inserting anti-abuse clauses in all tax treaties. On multinationals, it suggests "we will make sure that all companies, including multinationals, pay taxes to the Governments of countries where economic activity occurs and value is created, in accordance with national and international laws and policies". However, the agenda failed to endorse the demand of India and other Southern countries for a global tax body.

The modest achievement for India (however hailed as significant in diplomatic circles) has been to introduce new modalities in the constitution of the UN promoted international tax committee (Committee of Experts on International Cooperation in Tax Matters under the ECOSOC of the UN). The members of the committee shall henceforth be nominated by national governments and would have wider participation of developing countries. This deviates from the usual UN practice of nominations by the Secretary General. The frequency of meetings of this committee has been increased to two from one per year, a reflection of India's negotiating stance.

As a result of it the 11th session of the UN Committee of Experts on International Cooperation in Tax Matters in October 2015 addressed a number of critical issues. Major takeaways for the developing countries from this session were aplenty. Firstly, an adoption of a new article on the taxation of fees for technical services has been included for the next UN Model Double Taxation Convention between Developed and Developing countries (UN Model). Also a new practical Manual for the Negotiation of Bilateral Tax Treaties between Developed and Developing Countries has been adopted.[4] Secondly, in

a major fillip to the countries dependent on commodity exports (minerals), a subcommittee on Extractive Industries Taxation Issues for Developing Countries presented its work on tax treaty issues and indirect sales of extractive interests. The subcommittee has been entrusted to produce practical guidelines for developing countries, including on the tax treatment of decommissioning, VAT and re-negotiation of contracts.

Thirdly, the subcommittee on Exchange of Information presented a draft "Code of Conduct" to provide guidance for countries to cooperate in combating international tax evasion through enhanced transparency and exchange of information. It garnered tremendous amount of interested and suggestions to improve the draft shall be incorporated by the October session of the Committee in 2016. Lastly, United Nations Department of Economic and Social Affairs's (UNDESA) work in the area of capacity building, including the production of a "Handbook on Selected Issues in Protecting the Tax Base for Developing Countries" and the rich programme of training workshops and other activities with the participation of developing countries, in collaboration with international and regional organisations were appreciated by this Committee.

STI and SDGs: Technology Facilitation Mechanism (TFM)

The role of Science, Technology and Innovation (STI) in achieving the sustainable development goals (SDGs) as laid out by the Post-2015 Development Agenda has been recognised by the UN. International Council for Science (ICSU) has pointed out "The SDG framework poses a number of conceptual as well as implementation challenges that will require enhancing the close collaboration between the policy and scientific communities and other stakeholders". The Agenda 21 that emanated from the Earth Summit (1992), in its chapters 34 and 35 stressed on "Transfer of environmentally sound technology, cooperation and capacity-building" and "Science for sustainable development", respectively. S&T, knowledge sharing and capacity building featured prominently in the Rio+20 declaration and subsequent negotiations on the Post-2015 Development Agenda.

One of the key challenges in linking S&T and SDGs is how to facilitate technology transfer and build capacity in developing countries and LDCs in making use of S&T to achieve SDGs. There are barriers like IP rights and lack of capacity to absorb technology. It has been pointed out that the SDGs may not be achieved in most developing countries without a sustained industrialisation process. This could only be possible if transfer of competitive technologies to those countries take place. Moreover, while the industrialised countries should bear greater responsibility of environmental mitigation, sustainable industrialisation in the developing world would depend on easier access to green technologies. And finally, the impacts of emerging technologies on developing countries and LDCs and how they can use them to achieve their developmental needs and meet the objectives of SDGs need to be explored. Although many of the issues like technology transfer, capacity building and linking S&T policies with developmental goals have been discussed before, in the context of SDGs there is a need to examine past experiences, explore the role of emerging technologies and identify new approaches that will facilitate better use of S&T and Innovation in achieving SDGs.

India (along with Brazil) has been enthusiastically promoting the cause for a Technology Facilitation Mechanism (TFM) under the Post 2015 Development Agenda. The Group of 77 and China long held an unambiguous position on the establishment of a TFM which it considers as one of the most transformative means to implement sustainable development. India through its submissions has highlighted that, immediate and urgent delivery of technology development, deployment, dissemination and transfer to developing countries require suitable responses, including a continued emphasis by all countries on the enhancement of enabling environments, facilitating access to technology, and financing that leverages private sector financial resources. Current institutional arrangements are insufficient to deliver immediate and urgent technology development, deployment, dissemination, and transfer to developing countries.

India has achieved a fair amount of success in persuading the global community on the necessity of a TFM towards fulfilling the forthcoming development agenda across the developing world. The Addis Ababa Action Agenda documents final decision on part of world leaders to establish a technology

facilitation mechanism. The broad agreement on an institutional mechanism of technology transfer suggests important achievement by developing countries to keep technology issues as a central element in the 2030 Agenda. In the aftermath of the adoption of the new development agenda at the UN Sustainable Development Summit in September 2015, the UN would take the lead in designing appropriate institutional mechanism to formalise the TFM. However, it has to be borne in mind that there are no concrete commitments in the 2030 Agenda regarding technology transfer and its financing. Cooperation among emerging economies through platforms like the BRICS and IBSA to influence international institutional architecture on trade and technology to create an enabling environment for the feasibility of the TFM would be important.

The proposed TFM will be based on a multi-stakeholder collaboration between Member States, civil society, the private sector, the scientific community, agencies of the UN and other stakeholders (Box 1). The composition would include a United Nations inter-agency task team on science, technology and innovation for the sustainable development goals, a collaborative multi-stakeholder forum on science, technology and innovation for the sustainable development goals and an online platform. The proposed online open platform is expected to provide a comprehensive index of existing technologies and tools that would enable implementing the SDGs and a coordinated STI capacity building programme. The global platform will map existing technology facilitation mechanisms, needs and gaps, including in areas vital for sustainable development, including environment, agriculture, cities and health.

On the implementation of the TFM, Target 17.6 of the SDGs suggests "Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism." For example, the Asian and Pacific Centre for Transfer of Technology (APCTT), headquartered in New Delhi, has been an effective institutional mechanism for regional technology transfer and capacity building since its inception in 1977. APCTT is a regional institution of the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) serving in the

Box 1: TFM – Proposed Institutional Architecture

The proposal for the institutional architecture is taking shape primarily through inputs from various UN Agencies and other inter-governmental/multilateral institutions like UNDESA, UNEP, UNCTAD, UNIDO, ITU, WIPO, World Bank, and UNESCO. The proposed TFM will be based on a multi-stakeholder collaboration (STI Forum) between Member States, civil society, the private sector, the scientific community, agencies of the UN and other stakeholders. The composition would include a UN Inter-Agency Task Team (IATT) (29 UN entities as of now) on science, technology and innovation for the sustainable development goals, a collaborative multi-stakeholder forum on science, technology and innovation for the SDGs and an online platform. The proposed online open platform is expected to provide a comprehensive index of existing technologies and tools that would enable implementing the SDGs and a coordinated STI capacity building programme. The global platform will map existing technology facilitation mechanisms, needs and gaps, including in areas vital for sustainable development, including environment, agriculture, cities and health.

Since its establishment, the IATT has met three times. It adopted its Terms of Reference and decided to meet monthly. It is currently co-chaired by UNDESA and UNEP. Chairmanship of the IATT will rotate every two years among members. The IATT is working with 10 eminent representatives from civil society, the private sector and the scientific community to support the implementation of the TFM and in particular to prepare the STI Forum. The Inter-Agency Task Team is working on a concept note for the STI Forum. With regard to other tracks of work, the UN team has prepared an initial mapping of UN technology facilitation initiatives, which assessed more than 70 STI-related initiatives. The Task Team is also engaged in an ongoing reflection on system-wide capacity building efforts on science, technology and innovation. The IATT is also working to identify potential sources of funding, and to devise a strategy for mobilising resources to support the work of the Technology Facilitation Mechanism.

Source: UN.

Asia-Pacific region. The proposed TFM can implement coordination among regional mechanisms to take on global challenges minimising duplication of efforts and strategies. Box 2 gives a snapshot of mechanisms on technology transfer in APCTT activities.

The proposed framework and modalities of the TFM as yet, can best be described as nascent. It is felt that TFM might fail to attract the interest of major technology owners, such as transnational corporations. Nevertheless, it may provide an opportunity to enhance South-South Cooperation as well as to expand the exchange of technologies developed by SMEs. As already highlighted the TFM is accounting for all STI related initiatives under the UN processes and TFM is meant to encourage North-South, South-South

Box 2: Technology Transfer Support Services under APCTT

APCTT promotes technology transfer in the Asia-Pacific region through its ICT-based networks and platforms and its advisory services. Emphasis is placed on facilitating cross-border business cooperation among small and medium scale enterprises (SMEs) and promoting technology based business partnerships.

Online Technology Transfer Support Mechanisms

- Asia-Pacific Technology Transfer Market Service for SMEs
  - The Technology4SME Database serves as an online platform for information exchange on the availability and sourcing of technologies for small and medium enterprises in countries in the Asia Pacific region.
  - The Technology4SME Database provides information on the technologies available for transfer (technology offers), technologies needed (technology requests) as well as the opportunities for business cooperation (Joint venture and Partnerships).
  - The use of Technology4SME database is free of cost.
- Global Technology Databases
  - APCTT has compiled a list of global as well as country-wise technology databases that deal with the technology transfer related services for SMEs and entrepreneurs.
  - If a particular technology search has been made using APCTT's Technology4SME database and if the search did not yield desired results, the users could use this section to extend their search to other databases listed in this section.
  - Over 15 technology databases could be readily accessed through this service of APCTT. More technology databases from countries across the globe will be added periodically for the benefit of SMEs and entrepreneurs.
- Renewable Energy Technology Bank (RET-Bank)

  The primary objective of the Renewable Energy Cooperation-Network for the Asia Pacific (RECAP) established by APCTT is to facilitate technology transfer cooperation among countries in the Asia-Pacific region in the area of renewable energy. Towards this end, APCTT has developed a "Renewable Energy Technology Bank (RET-Bank)" of tested and proven renewable energy technologies (RETs) initially in the areas of solar, biomass, wind, mini-hydro power and geo-thermal energy. APCTT has developed this Renewable Energy Technology Bank as on-line technology database freely available for public access through its RECAP website.

Technology Transfer Facilitation Services

APCTT offers technology transfer facilitation services to technology providers and seekers, especially by partnering with its national focal points and technology transfer intermediary networks. Some important technology transfer facilitation services of APCTT include:

- Providing information on technology transfer, joint-venture, business/research partnerships and opportunities.
- Organising business-to-business meets, technology exhibitions and technology transfer related conferences and technology dissemination workshops in partnership with APCTT focal points in the member countries.
- Providing support services to help techno-entrepreneurs interact with technology transfer intermediaries, source technology globally, and also explore venture capital financing.

Source: APCTT.

Box 3: South-South Cooperation to Boost Climate Resilience

A thematic dialogue convened by the Technology Executive Committee (TEC) of the UN Climate Convention in April 2016 will highlight policies that can contribute to successful South-South Cooperation on adaptation technologies. The event aims to support countries to become more resilient to the inevitable impacts of climate change through the use of technologies such as seawalls, drought-resistant crops, land management techniques, disaster-risk management and rain-water harvesting.

The TEC is holding the thematic dialogue as part of its 12th meeting, at which it will develop a new workplan and consider issues such as: technology needs assessments; climate technology financing; enabling environments and barriers; and mitigation and adaptation technologies. The two bodies of the UNFCCC's Technology Mechanism work together to enhance climate technology development and transfer. The TEC addresses technology issues and identifies policies that countries may use to enhance climate technology development and transfer. The Climate Technology Centre and Network (CTCN) is currently responding to developing country requests to enhance technology action on the ground.

Source: UNFCCC TEC Expert Meeting, April 2016.

and Triangular cooperation. India strongly advocates South-South Cooperation and climate change by all means remains an important area for international technological cooperation. The evolving framework and principles of South-South Cooperation should be leveraged in that direction. Recent efforts under the UN Framework Convention for Climate Change (UNFCCC) after Paris COP 21 support South-South Cooperation in technology to address issues of climate change (Box 3).

However, assessing the quality and effectiveness of technologies eventually offered through the TFM is an important operational challenge to be faced. Building upon the initiatives within the UN, there is further scope towards identifying measures for implementation of the TFM and how India can contribute in that process and benefit from the evolving framework. In that respect, key strategies on national technology assessment have to be designed and implemented. It would also be important to have reformed institutions and approaches around issues like IP ownership and technology commercialisation so that appropriate balance between inventor's right and social obligation towards making knowledge available and accessible is achieved. Finally, institutionalising robust evaluation and reporting mechanism would add to the effectiveness of the new mechanism that relies both on national efforts as well as on international cooperation.

Implementation of the SDGs in India

The key to the success of the SDGs is often highlighted in terms of maximum decentralisation for policy planning and implementation. This could be the only viable route for a country of India's size and proportions. India has always supported decentralisation and empowerment of grassroots institutions. State governments have a preeminent role in implementing development projects undertaken by the centre as well as the states themselves. At this juncture, there is need to sensitise individual states on the forthcoming global development agenda and its implications for India. They should be legitimate partners in drawing up the most appropriate implementation roadmap.

However, decentralisation should not prima facie impose new challenges in the Indian context given robust federal structure of governance supported by democratic institutions at all levels. Nevertheless, the challenge persists as we suggest holistic approach for the fulfilment of SDGs that comprise social, economic and sustainable dimensions. This has further implications for domestic resource mobilisation at the national level to serve local needs on these counts. While overall economic policy direction is framed at the union level and national programmes on development are designed at the centre, states implement significant social sector infrastructure development projects and design policies to some extent on resource mobilisation. Increasingly, more powers in these areas are being transferred to the states in order to expedite programme implementation and ensure greater grassroots participation. But centre-state relations in terms of resource mobilisation and utilisation continue to remain an area difficult to manage pending new age reforms on revenue collection and distribution.

The Planning Commission which has been an important institution post Independence and functioned as a Central Ministry was mainly in charge of annual disbursal of central funds to the states and determined the state specific shares. Needless to mention, this mechanism was heavily centralised with disproportionate say of government at the centre. The five year plans formulated by the planning commission continued to direct the central departments in terms of the objectives and expenditures. Over the recent decades, as the government withdrew from industrial production in a large number of sectors and liberalised industrial licensing policies, the role of the Commission was more concentrated in setting five year plan objectives for overall economic growth on one hand and social sector development on the other. In doing so, the Commission had developed a practice of evaluation of the progress made under ongoing five year plans in areas of economic performance, social sector development, industry, energy management, environment and sustainability. The Planning Commission, though with a lag, had absorbed some of the MDG targets in the process of national planning. This was more prominent during the 10th five year plan. Other central departments were also encouraged to do so. Monitoring of MDG targets was accomplished in some sectors.

The new NDA government chose to bring in significant reform in the institution and replaced the Planning Commission with National Institution for Transforming India (NITI Aayog) do to away with rigid and centralised policy planning. The vision of the new government is cooperative federalism where it aspires to partner states in key policies spanning economy and social sector development. While the older institution was effective in terms of broad policy planning, the new body is conceptualised as a think tank with much more focussed attention on policy dialogues and formulation at multiple tiers. Fortuitous as it may seem, the new institutional reform came in the same year when India along with the world has adopted the SDGs. This global framework sets targets for national governments, however, with significant policy space at the national level to attune national policies according to domestic priorities. The global framework would nonetheless be useful in strengthening policy coherence among various sectors as enshrined in the cross domain approach of the SDGs. The new institution, unlike the previous one, should take much serious note of inter linkages that exist between the sectors of the economy and their feedback on social development and sustainability.

NITI Aayog may be rightly placed not only to initiate major policy planning in the fulfilment of the SDGs, but would also be able to coordinate policies with a broad spectrum of government departments. It may play a crucial role in explaining the goals and the targets and their interlinkages to the wider policymaking infrastructure within the government. At the next level it should define the policy space for the states in this regard and ensure maximum participation of the states in policy formulation at both levels. This would entail proper direction on institutional mechanisms for anchoring the SDGs at the state level for their effective implementation. However, there are concerns around the strategy this new institution would adopt. It is observed that without the earlier authority which the Planning Commission enjoyed over demand and expenditure of central resources, NITI Aayog may not have the direct tools to influence the approach of several key departments at the centre including the finance and revenue departments or bring about effective coordination.

It would be important to note that India as an emerging economy has mature governance institutions to ascertain the future needs and develop policies accordingly. It has often been highlighted that ongoing programmes run by the government are comprehensive towards achieving multiple dimensions of social and economic progress. These are large scale in terms of resources and reach and have been intelligently designed towards effective delivery through appropriate use of technology. India has made significant progress in terms of creating comprehensive digital and biometric registry of its citizens and has taken steps towards minimising exclusions in service delivery. Programmes focussed on financial inclusion, real time and meaningful digital connectivity through leveraging ICT and skill development are projected as key enablers of development and empowerment. On sustainability India has already initiated key programmes on energy efficiency and renewable energy with even higher ambitions compared to that of the SDGs in terms of shorter deadlines. Such efforts have prompted India to enthusiastically accept the SDGs. Aligning government programmes to include targets enshrined in the SDGs would make their

evaluation and monitoring effective. This should also encourage policymakers to appreciate and define the scope of these policies towards attaining cross sectoral objectives in the spirit of the SDGs.

However, India continues to score low on the social development indicators and have numerous pockets of backwardness. Research has indicated that backwardness measured in terms of non-income indicators such as hunger, infant mortality and literacy may not be exclusive to poorer states. At the same time states with lower poverty head count ratio continue to have backward districts (Bakshi *et al.*, 2015). Moreover, the Indian trajectory of economic growth has led to rising inequalities in the absence of adequate expansion of employment opportunities. The model of economic growth adopted by India may not be very different from those followed by early industrialised countries and hence the question of sustainability is paramount with rising prosperity. The SDGs form a reference point in this regard and would remind the state of its global commitment to ensure progress on all counts of sustainable development. However, it would be wrong to perceive that SDGs are only meant to define the domestic policy space. It is also an agenda for means of implementation at the global level and has enormous bearing on international institutions governing economy, environment and technology. Effective coordination between concerned departments of the government so that India presents a coherent perspective with robust and concrete policy recommendations for institutional reforms would go a long way in strengthening India's position at global negotiating platforms. Again, participation of states on such matters of foreign policy would only make the process more informed and inclusive.

Concluding Remarks

In this paper we have elaborated the context in which India might position itself with regard to the SDGs on global governance issues as well as domestic implementation. One important approach that caters to both is South-South Cooperation. Collaboration among Southern countries not only strengthens the southern narrative on development and sustainability at Global forums but also effectively complements national strategies through sharing of best practices, sustainable use of resources available regionally and partnering in development projects catering to common challenges. South-South Cooperation encourages partners to have a responsibility for self-development in a mutually beneficial relationship by strengthening autonomous capacity for goal setting, decision making and national implementation. Strengthened regional cooperation can play an important role in mobilising financial resources for sustainable development. Among others, effective regional arrangements can provide financing for regional public goods, facilitate trade flows and attract investment into key sectors such as infrastructure.

Attaining SDGs in India would also be critically linked to the level of cooperation in the immediate neighbourhood, i.e. South Asia for sustainable use of natural resources, peace and economic progress through conducive regimes of regional trade and economic development. Such cooperation would not only be effective for resource mobilisation and project development but would be important for designing common indicator framework on regional development outcomes aligned with the SDG targets. India's development cooperation in South Asia may be leveraged to achieve confidence among regional partners on benefits of such common approaches to common challenges. The SDGs with its life of 15 years offers opportunities for speedy transformation. India along with South Asia cannot afford to miss this opportunity.

Endnotes

[1] Apart from development finance the other critical area is climate finance. The first calls for institutional mediation to ensure equitable economic progress globally and social welfare, the latter remains contentious on grounds of common but differentiated responsibilities. In the recently concluded COP21 in Paris, even as the countries could ensure commitments on reduction of green house gases contributed by both the developed and developing worlds, developed countries resisted greater commitments on their part towards resources on climate mitigation globally.

[2] Low- and lower-middle-income countries may need to increase public and private expenditure by some US$ 1.3 trillion per year (US$ 342 – 355 billion for LICs and US$ 903 – 938 billion for LMICs) in order to reach the SDGs. This corresponds to 4 per cent of these countries' estimated GDP over the period measured in purchasing power parity (PPP) and 11 per cent of GDP in international dollars, or 0.7 – 1.1 per cent of world GDP. At the global level an incremental 1.3 – 2.0 per cent of world GDP may be required to finance the achievement of the SDGs in all countries. Domestic resource mobilisation in developing countries can increase significantly through international support to improve domestic capacity for tax and other revenue collection leaving a financing gap of US$ 133 – 161 billion per year or 0.23 per cent of high-income countries' GDP. (http://unsdsn.org/resources/publications/sdg-investment-needs/)

[3] In a recent report by the Global Financial Integrity group funded by the Government of Finland, it is suggested that between 2004 to 2013 the developing world as whole lost US$ 7.8 trillion and in real terms these flows increased at 6.5 per cent per annum. See Kar and Spanjers (2015).

[4] Members of the Committee also decided to establish two new subcommittees: (1) Subcommittee on Royalties, with the mandate to propose an update of Article 12 of the UN Model and its Commentary, particularly on the tax treatment of industrial, commercial and scientific equipment and software-related payments; and (2) Subcommittee on Mutual Agreement Procedures – Dispute Avoidance and Resolution, to study the topic, provide guidance and propose any necessary updates to the UN Model in that respect.

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Goal 17: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development : Targets and Indicators	
Finance	
17.1 Strengthen domestic resource mobilization, including through international support to developing countries, to improve domestic capacity for tax and other revenue collection	17.1.1 Total government revenue as a proportion of GDP, by source
	17.1.2 Proportion of domestic budget funded by domestic taxes
17.2 Developed countries to implement fully their official development assistance commitments, including the commitment by many developed countries to achieve the target of 0.7 per cent of gross national income for official development assistance (ODA/GNI) to developing countries and 0.15 to 0.20 per cent of ODA/GNI to least developed countries; ODA providers are encouraged to consider setting a target to provide at least 0.20 per cent of ODA/GNI to least developed countries	17.2.1 Net official development assistance, total and to least developed countries, as a proportion of the Organization for Economic Cooperation and Development (OECD) Development Assistance Committee donors' gross national income (GNI)
17.3 Mobilize additional financial resources for developing countries from multiple sources	17.3.1 Foreign direct investments (FDI), official development assistance and South-South Cooperation as a proportion of total domestic budget
	17.3.2 Volume of remittances (in United States dollars) as a proportion of total GDP
17.4 Assist developing countries in attaining long-term debt sustainability through coordinated policies aimed at fostering debt financing, debt relief and debt restructuring, as appropriate, and address the external debt of highly indebted poor countries to reduce debt distress	17.4.1 Debt service as a proportion of exports of goods and services
17.5 Adopt and implement investment promotion regimes for least developed countries	17.5.1 Number of countries that adopt and implement investment promotion regimes for least developed countries
Technology	
17.6 Enhance North-South, South-South and triangular regional and international cooperation on and access to science, technology and innovation and enhance knowledge-sharing on mutually agreed terms, including through improved coordination among existing mechanisms, in particular at the United Nations level, and through a global technology facilitation mechanism	17.6.1 Number of science and/or technology cooperation agreements and programmes between countries, by type of cooperation
	17.6.2 Fixed Internet broadband subscriptions per 100 inhabitants, by speed

17.7 Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed	17.7.1 Total amount of approved funding for developing countries to promote the development, transfer, dissemination and diffusion of environmentally sound technologies
17.8 Fully operationalize the technology bank and science, technology and innovation capacity-building mechanism for least developed countries by 2017 and enhance the use of enabling technology, in particular information and communications technology	17.8.1 Proportion of individuals using the Internet
Capacity-building	
17.9 Enhance international support for implementing effective and targeted capacity-building in developing countries to support national plans to implement all the Sustainable Development Goals, including through North-South, South-South and triangular cooperation	17.9.1 Dollar value of financial and technical assistance (including through North-South, South-South and triangular cooperation) committed to developing countries
Trade	
17.10 Promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system under the World Trade Organization, including through the conclusion of negotiations under its Doha Development Agenda	17.10.1 Worldwide weighted tariff-average
17.11 Significantly increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports by 2020	17.11.1 Developing countries' and least developed countries' share of global exports
17.12 Realize timely implementation of duty-free and quota-free market access on a lasting basis for all least developed countries, consistent with World Trade Organization decisions, including by ensuring that preferential rules of origin applicable to imports from least developed countries are transparent and simple, and contribute to facilitating market access	17.12.1 Average tariffs faced by developing countries, least developed countries and small island developing States
Systemic issues	
Policy and institutional coherence	

17.13 Enhance global macroeconomic stability, including through policy coordination and policy coherence	17.13.1 Macroeconomic Dashboard
17.14 Enhance policy coherence for sustainable development	17.14.1 Number of countries with mechanisms in place to enhance policy coherence of sustainable development
17.15 Respect each country's policy space and leadership to establish and implement policies for poverty eradication and sustainable development	17.15.1 Extent of use of country-owned results frameworks and planning tools by providers of development cooperation
Multi-stakeholder partnerships	
17.16 Enhance the Global Partnership for Sustainable Development, complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the Sustainable Development Goals in all countries, in particular developing countries	17.16.1 Number of countries reporting progress in multi-stakeholder development effectiveness monitoring frameworks that support the achievement of the sustainable development goals
17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships	17.17.1 Amount of United States dollars committed to public-private and civil society partnerships
Data, monitoring and accountability	
17.18 By 2020, enhance capacity-building support to developing countries, including for least developed countries and small island developing States, to increase significantly the availability of high-quality, timely and reliable data disaggregated by income, gender, age, race, ethnicity, migratory status, disability, geographic location and other characteristics relevant in national contexts	17.18.1 Proportion of sustainable development indicators produced at the national level with full disaggregation when relevant to the target, in accordance with the Fundamental Principles of Official Statistics
	17.18.2 Number of countries that have national statistical legislation that complies with the Fundamental Principles of Official Statistics
	17.18.2 Number of countries with a national statistical plan that is fully funded and under implementation, by source of funding
17.19 By 2030, build on existing initiatives to develop measurements of progress on sustainable development that complement gross domestic product, and support statistical capacity-building in developing countries	17.19.1 Dollar value of all resources made available to strengthen statistical capacity in developing countries
	17.19.2 Proportion of countries that (a) have conducted at least one population and housing census in the last 10 years; and (b) have achieved 100 per cent birth registration and 80 per cent death registration

18

Technology Facilitation Mechanism (TFM): A Review of the Current Proposals and Way Forward

Introduction

Transfer of technology, especially that of environmentally sustainable technologies (ESTs), has been discussed by Commission on Sustainable Development (CSD) and as a follow up of Agenda 21 in Rio+20 processes. However, there was no significant outcome as North-South divide on many issues, particularly intellectual property rights stalled further progress. The proposal to establish a mechanism to bridge the technology gap was resisted and there was no agreement to establish one in the June 2012 conference but the outcome document called for a mechanism to facilitate technology transfer and requested the UN Secretary General to make recommendation regarding the facilitation mechanism. The UN Secretary General's report 'Options for a facilitation mechanism that promotes the development, transfer and dissemination of clean and environmentally sound technologies (A/67/348)' acknowledged the need for a global TFM under the auspices of UN and made recommendations regarding TFM and for constitution of intergovernmental preparatory working group for establishing TFM. This was followed by workshops in 2013 and the second report from UN Secretary General released in August 2013 acknowledged the demand for global TFM and this could involve scaling up the initiatives in place and/or creating new initiatives, including a technology development and transfer fund. As a follow up four structured dialogues were held in 2014. An UN Inter-Agency working group was formed to take up establishing TFM and later this was converted into Inter-Agency Task Force on Science, Technology and Innovation for SDGs as part of the proposed TFM. In 2015, the discussions over TFM were followed up in the financing for development talks and the post-2015 intergovernmental negotiations. Despite efforts of developing countries, developed countries continued to resist the proposal for TFM arguing there was no consensus on establishing TFM. However, eventually in June 2015 the Financing for Development talks concluded with Addis Ababa Action Agenda (AAAA) agreed upon and in the paragraph 123 it was stated that member states decided to establish TFM to be launched in the UN Summit for Post-2015 Development Agenda in September 2015. Thus TFM was officially launched in that Summit.

Technically, TFM is an initiative of the UN and it has raised lots of hopes and expectations, but unless TFM becomes a fully functional institution with clear cut objectives supplemented by institutional mechanisms backed with resources it may end up as another initiative that has not taken off. The stakes for the South in TFM are high and but for the persistence and efforts of the South it would not have been created. TFM in that sense is much more than a technology transfer initiative. It reflects the aspirations of the South and invokes the quest to use S&T to achieve the SDGs.[1] In the context of SDGs there has been much discussion on how S&T can contribute to SDGs and what measures are needed to harness the potential of S&T, particularly in facilitating technology transfer and use.[2]

This paper reviews the current proposals for TFM and examine whether they would fulfill the original mandate for TFM and suggestions are made as to what should be done to make TFM an effective mechanism.

It is pointed out that TFM should not end up as a forum or as a mere data bank and information clearing house and instead should become an institution that addresses the multiple challenges in technology transfer and utilisation across sectors and technology with focus on issues in capacity building, handling IP rights and licensing and promoting absorption of technology. The current initiatives regarding TFM are necessary but not sufficient to make this a dynamic mechanism and G77 and China should take the lead in moving TFM forward.

The Addis Agenda in paragraphs 119-123 commits to strengthen coherence and synergies among science and technology initiatives within the UN system, proposes a technology facilitation mechanism to support SDGs and commits to operationalise the Technology Bank for LDCs by 2017. TFM was formally inaugurated in Addis last year and later a 10 member Advisory Panel was nominated by UN Secretary General. According to UNDESA TFM consists of three elements:

> *1) a United Nations inter-agency task team on science, technology and innovation for the sustainable development goals;*
>
> *2) an annual multi-stakeholder forum on STI for SDGs; and*
>
> *3) An online platform as a gateway for information on existing STI initiatives, mechanisms and programmes.*[3]

UN Inter-Agency Task Team and Online Platform

The inter-agency task team has been established and the proposal for an online platform has been put forth while the multi-stakeholder forum will be held as planned. In addition to these the first meeting of the 10 member group has been held in March and an online discussion on ST&I and SDGs has been organised by DESA in April-May 2016. These indicate that TFM is still in the agenda and new steps are being taken. But the question is are they sufficient and whether all the discussion and debates in fora would lead to some where or will they end up as talking shops.

Few proposals have been put forth by the UN inter agency group and UNIDO such as Technology Bank and IP bank for LDCs. The inter-agency group produced a report that examined the current programmes and initiatives involving UN agencies, identified the issues and challenges in technology transfer and made the following suggestions :

- Improving coverage and data quality, building on the structured information on technology related initiatives within UN system;
- Identify relevant initiatives that did not originate from UN system but involving others for collection of comparable information;
- Better understand STI needs through taking stock of available information at country, regional or country groups level; and
- Undertake systematic reviews on selected themes for further deliberation on UN system's initiatives and outcomes and responsiveness to needs.[4]

The report is an excellent document that scopes, analyses and illustrates the issues with initiatives in UN system, the shortcomings in the current efforts and the inter-sectoral linkages in the initiatives and SDGs. But it does not put forth suggestions that would strengthen the TFM. As a result all the good analysis is not followed with tangible proposals that would go a long way in making TFM more relevant and functional. The report reiterates the proposals in the Addis agenda. In addition it has proposed the following.

The idea of an online platform and the three models suggested as above are good examples for what could be done through online platforms. But the issue is whether online platforms are really suitable for the envisaged tasks of the TFM. Technology facilitation is more than information sharing or pooling of information resources and exchanging knowledge and experience. In fact as a paper from UNESCAP states:

> *"Technology transfer is a broad and complex process which represents more than just the moving of equipment and other so-called "hard" technologies, but also includes knowhow, goods and services, and institutional procedures. Data on the movement of "hard" technologies is patchy whilst measurement of "absorptive capacity" or "know-how" is incredibly difficult to measure. Academic studies to date have reached neither consensus on the best mechanism for technology transfer nor what the critical level of absorptive capacity is.*[5] *(p5).*

Unfortunately this reality is not taken into account in the above proposals or in the discussions on using online platforms and information sharing as part of TFM. Further the real problem is that capacity building is a complex activity that is often a long time process to be done in the real world and online delivery cannot play an important role in it.

The idea of 'Fully Integrated Platform' cannot function as a coordinated STI capacity building programme because capacity building in STI has to be preceded by an in depth analysis of National Innovation System (NIS) and its components to diagnose the weaknesses and to identify what sectors would need capacity building on a priority basis. It is an irony that UN agencies like APCTT have done studies on NIS in countries in Nepal and have come out with policy prescriptions for strengthening NIS but a document from the interagency group presumes that integrated platforms would be sufficient for capacity building in STI.

One is not denying the need for such integrated platforms but the question is how adequate they will be given the enormous challenges in capacity building in STI. Such platforms can supplement capacity building programmes that involve working with components of NIS for capacity building but cannot be the primary vehicles for capacity building in STI.

Multi-stakeholder STI Forum

The inter-agency report correctly identifies the problems and issues with the UN system that need to be addressed and the analysis in that can logically lead to suggesting tangible outcomes that would enable UN agencies to contribute better to TFM. Still it does not go beyond the idea of integrated platforms and online solutions, echoing the points made in Addis agenda. The Addis agenda should be considered more as a starting point than as the final outcome for implementing TFM. The proposal for the online platform has to be developed further. As of now there is not much clarity on the platform and how it would be institutionalised and who would contribute the financial and other resources. The proposal indicates that stakeholders outside UN system can participate and contribute to them. This needs to be welcomed. But unless there is an in built mechanism to vet/ screen contributions from outsiders and integrate them suitably, the platform could be used by many solely for commercial purposes in the guise of capacity building, sharing knowledge and experience. The envisaged platform includes offline content delivery but what exactly would be delivered on line and what would be delivered off line is not clear.

Fundamentally a robust platform can perform many functions but before building such platforms experiences in using online platforms and similar

Online Platform Options

(1) Online library	• Repository and mapping of STI-related UN resources, platforms and activities, and directory of partnerships. • Periodic updates and news. • Limited inter-operability with UN platforms.
(2) Dynamic Exchange of Knowledge and Experiences	All of the above plus: • Content exchange with public and private users, including through forums and partnerships. • Community-of-practice, user-generated content, tools for knowledge capture. • Quality assurance, common taxonomies, user ID and access control, and wiki-type metadata architecture.
(3) Fully Integrated Platform for Operational Delivery	All of the above plus: Functions related to a coordinated STI capacity building programme, with online and offline delivery, content coordination and integration, supported by communities of practice and various partnerships, going beyond the UN system.

mechanisms for purposes such as development and distribution of content, and, in capacity building in STI should be taken into account. There is a danger of platform becoming too complex to navigate and use with information overload deterring users who seek relevant information that can be applied by this. In fact it would be ideal that instead of an integrated platform, various mechanisms such as information and data sharing, clearing house for sharing innovations and their transfer and capacity building activities are made available as separate platforms with facility to link them and navigate from one to another. This will also help in creating sub-platforms for each major activity in each region or in different sectors. In my view it would be desirable that this is built up as working modules than conceptualised as a mega-platform to begin with. Establishing working modules and modifying them based on users needs and experiences should be done first and then integration can be undertaken.

Having pointed out this, one would urge the UN agencies to establish within their portals a module or a mini-platform for all TFM related activities and programmes, so that both users and stakeholders will be able to identify what each UN agency can provide them and how they can benefit from their initiatives. The fully integrated platform should not end up as a top-driven, UN system oriented one and should have scope for user inputs and suggestions right from the initial stages.

Technology Bank

The proposed Technology Bank has two components: (1) Science, Technology and Innovation Supporting Mechanism (STIM), and (2) Intellectual Property Bank (IP Bank).[6] The STIM is expected to build upon existing initiatives and enable development of NIS is LDCs. The proposal builds upon existing STI initiatives for LDCs such as UN Research4Life, National Education and Research Networks (NERNs) and Digital Access for Research Transfer and Transformation (DART) is proposed. The STI initiatives referred to cater mostly to the needs of researchers and scientists and DART will also facilitate access to research data and publications. The report points out that these can play an important role in meeting the knowledge needs of researchers in LDCs. They will also provide better connectivity to researchers and institutions. This proposal certainly deserves to be implemented. But in my view this will not enable much transfer in technology, nor greatly enhance the capacity in NIS because it addresses only one dimension, i.e. access to knowledge resources and networking with connectivity.

But the hard questions are not addressed in this proposal although the report mentions the state of ST&I in LDCs and identifies the issues with NIS and rightly points out what is lacking in LDCs in harnessing ST&I for development. Having done an excellent analysis of the problem, the Group should have come out with an ambitious proposal that would go beyond the Technology Bank.

STI Policy and Capacity Building (SPCB) as suggested in the report aims at building collaboration and networking and intends to capitalise on current programmes and initiatives in education, research and training in S&T such as fellowships, research grants, etc. The success of this would depend largely on external sources of funding and support. STIM thus fails to address or consider the structural issues in NIS in LDCs, particularly the lack of funding for education and R&D. STIM ideally speaking should be a programme that addresses the structural constraints, issues in networking and collaboration and should enable capacity building with a long term perspective. Reliance on external programmes and funding agencies alone without initiatives in building endogenous capacity is not the right approach.

The other proposal IP bank is more comprehensive and goes beyond addressing IP issues. But the work plans envisaged in the initial years are very limited and these would need only consultants. The IP bank proposal could be expanded further and it should cover *inter alia,* training on using flexibilities in TRIPS, enabling access to technologies in public domain, and promotion of open source and open innovation. For example, it could help LDCs to get access to open source software and help them to promote open innovation. Under capacity building, co-operation with organisations like Public Interest Intellectual Property Advisors (PIIPA), South Center and RIS will help LDCs to understand the implications of TRIPS and TRIPS Plus and examine the options available to them for strengthening public

domain, open access and formulate IP policies that balance the need to promote innovation and enhancing access to knowledge and public goods. The objective of the capacity building initiatives in IP should not be just strengthening IP regimes or making LDCs emulate the IP policies of developed countries. Rather capacity building in IP should make them understand the costs and benefits of different types of IP regimes and decide accordingly.

The Technology Bank proposal could be restructured as a Bank with two initiatives, ST&I capacity building initiative and Technology Facilitation Initiative (TFI). The former should be a comprehensive initiative on capacity building in ST&I while the latter would be an initiative that goes beyond IP. The first initiative would cover assessing and strengthening NIS, developing S&T collaborations with other countries including South-South Co-operation, liaise with UN agencies, funding agencies and other institutions for mobilising resources in ST&I and planning for use of ST&I for SDGs. This will work closely with the government departments, striving to create a synergy among different programmes. It will also monitor the use of S&T in projects related to SDGs and measure the progress in S&T capacity building through indicators and goals.

TFI will cover technology acquisition, transfer of technology and absorption, capacity building in technology utilisation and adopting technologies, promoting reverse engineering, open source and open innovation, developing and executing a comprehensive IP policy and strategy. TFI will promote and manage clearing houses, patent pools and will interact with various Patent Sovereign Funds and similar organisations holding/acquiring patents for technology acquisition and sharing besides developing best practices and guidelines in IP creation and sharing.

These two initiatives are complementary and working together they can address many of the problems in ST&I capacity building and in technology acquisition, use and diffusion.

Technology Assessment

The fundamental problem with the proposals analysed above is that they do not meet the vision set for TFM by developing countries. This vision as expressed in different documents is broad and sees TFM as a real mechanism for technology transfer, capacity building in ST&I and in achieving SDGs. This would call for ambitious, long term initiatives that would build upon current programmes, build new institutional structures and develop various mechanisms under TFM to address specific issues.

For example, it would include conducting Technology Needs Assessment (TNA) for each country and identify the needs, the national level capacity and explore how the needs can be matched with available technologies and in turn how the relevant technologies can be accessed or acquired.[7] TNA was introduced first in the context of UNFCCC and since then has been used in technology transfer mechanisms under UNFCCC.

Any discussion on TFM should take into account the global trends in ST&I and identify how emerging technologies can be used for achieving SDGs. While the UN system and others have produced documents on role of ST&I , and SDGs very little work has been done specifically on using emerging technologies in TFM or in identifying relevant applications in emerging technologies for meeting SDGs in health, water and food security. Given the wide variance in ST&I capacity across regions and countries, TFM should examine how the S&T capacity of different countries in a region can be harnessed for achieving SDGs in that region, particularly by LDCs. For example, in the context of Asia-Pacific region, some countries have emerged as leading innovators in new technologies and have ambitious programmes to enhance their respective national capacities in S&T but many countries in the region lag behind in ST&I capacity. Elaborating this point the report from ESCAP highlights how Korea, China and Japan are in the forefront of technologies like robotics and 3D printing and Korea's R&D expenditure which is 4.5 per cent of GDP enables it to become a leader in frontier technologies. The report also states that as per the Global Innovation Index many countries in the region lag behind in innovation, as more than a quarter of the countries ranking in the bottom 10% are from this region. Regional collaboration can play an important role in bridging the gap and TFM can play an important role in this.

Conclusion

The proposals on TFM do not seem to give much importance to South-South Collaboration (SSC) in S&T capacity building or in achieving SDGs. The earlier paradigm of unidirectional technology transfer from North to South is no longer relevant now. Given the successful examples of SSC in different fields such as biotechnology, ICT for development and health, integrating SSC in TFM framework would facilitate more SSC and enhance the relevance and scope of TFM for South, particularly LDCs. Proposals on TFM should also explore how best they can work with joint ST&I programmes in IBSA and BRICS. This can result in bilateral/trilateral collaboration involving IBSA/ BASIC. Another idea would be to link ST&I initiatives in development aid co-operation (DAC) with TFM so that TFM can use the DAC mechanisms and also contribute to better outcomes from S&T programmes under DAC.

To sum up, it is high time to rethink the proposed programmes of TFM and call for a more ambitious TFM. Although so far there have not been major critiques of TFM from South, the observations and cautions from India are worth paying attention to. Analysing the current scenario in TFM, Mr.Amit Narang, of the Indian Mission to the UN said: "The key however is that the TFM cannot be a passive platform for airing of oft heard positions. In other words, it cannot be a talk shop. It has to be an active space of action oriented collaboration."[8]

He has also discussed what should TFM be doing and the shortcomings of some ideas on TFM. Echoing the views of the South he has rightly cautioned that TFM should move ahead with a broad agenda and work plan lest should it become yet another talking shop.

Given the high stakes for the South in TFM, G77 and South should critically examine the proposed plans for TFM, its current architecture and come up with alternative plans and proposals. At present the TFM seems to be UN centric and making it UN centric or a programme under DESA may diminish its relevance and credibility with stakeholders. Instead TFM should be made an autonomous body that can be housed in a UN agency. It's structure should enable participation by different stakeholders with adequate representation from South in governing TFM.

At this stage finance and mobilisation of resources for TFM remain unclear. Given the proposed limited activities in the initial years under the proposals discussed in this paper not much would be required to set up and run online libraries and/or on-line platforms. But when TFM starts with very limited activities and without a well defined agenda for the initial years, it runs the risk of ending up more as a show case for certain objectives than as a robust mechanism to facilitate technology.

Instead it should have an ambitious plan but can start as a small initiative that can be scaled up over the years. It's structure should be modular and it can examine which model would suit it. The TEC under UNFCCC has a model that can be appropriate for some functions. TFM can have regional level programmes and initiatives and these can be attached to regional UN commissions such as ESCAP.

Finally the time has come to push forward the TFM agenda with well defined plans and a vision that would inspire confidence. In the absence of keen interest by the North in taking forward the TFM, it would be the duty of G77&China to take the lead and bring in new dynamism in affairs relating to TFM. If this is not done the TFM in its final shape may not be one they wanted and worked for.

Endnotes

1 Submission by Government of India on A Global Technology Facilitation Mechanism under the Auspices of the United Nations, July 2013 and Technology Facilitation Mechanism Input from United Nations Environment Programme (UNEP), 2012.

2 See, for example, William Colglazier , "Sustainable Development Agenda: 2030", *Science*, Vol. 349, Issue 6252, pp. 1048-1050

3 https://sustainabledevelopment.un.org/TFM

4 United Nations Inter-agency Working Group on a Technology Facilitation Mechanism Background Paper No. 2015/1, "An Overview of the UN Technology Initiatives," by Wei Liu, Naoto Kanehira and Ludovico Alcorta.

5 "Science, Technology and Innovation AAAA commitments and implications for implementation and monitoring." Trade, Investment and Innovation Division (TIID), Economic and Social Commission for Asia and the Pacific. Draft discussion paper submitted to the First High-Level Followup Dialogue on Financing for Development in Asia and the Pacific meeting, Incheon, 30-31 March. Available at www.unescap.org/events/apffd-rok

[6] *Feasibility Study for a United Nations Technology Bank for the Least Developed Countries,* United Nations Secretary-General's High-Level Panel on the Technology Bank for the Least Developed Countries. UN, New York.

[7] See also Manuel F. Montes, "Five Points on the Addis Ababa Action Agenda." South Centre Policy Brief 24, March 2016, for a discussion on TFM, IP and SDGs.

[8] Intervention by Mr. Amit Narang, Counsellor, Permanent Mission of India to the United Nations on 'Technology Facilitation Mechanism' during 'Time to deliver the 2030 Agenda: A Seminar on Galvanizing Global Action' Cohosted by the Permanent Missions of Brazil and Switzerland and NYU CIC on 29 February 2016 https://www.pminewyork.org/pages.php?id=2387

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Financing for Development: Emerging Modalities

Introduction

The Third International Conference on Financing for Development (FfD3) held in July 2015 in Addis Ababa was mandated by the UN to deliberate on issues related to finance ahead of the two crucial international meetings held that year namely, the UN Sustainable Development Summit and the 2015 Paris Climate Conference (COP 21). The UN Sustainable Summit adopted the Sustainable Development Goals through the launch of the 2030 Agenda for Sustainable Development. The FfD3 concluded with what is known as the Addis Ababa Action Agenda.

The scope of the Third International Conference on Financing for Development was set out in UN General Assembly resolutions 68/204 and 68/279:

1. Assessing the progress made in the implementation of the Monterrey Consensus and the Doha Declaration and identifying obstacles and constraints encountered in the achievement of the goals and objectives agreed therein, as well as actions and initiatives to overcome these constraints.
2. Addressing new and emerging issues, including in the context of the recent multilateral efforts to promote international development cooperation:
    - the current evolving development cooperation landscape;
    - the interrelationship of all sources of development finance;
    - the synergies between financing objectives across the three dimensions of sustainable development; and
    - the need to support the United Nations development agenda beyond 2015.
3. Reinvigorating and strengthening the financing for development follow-up process.

Against this backdrop, in the section following this introductory section we discuss the issues of domestic resource mobilisation in the Indian context ahead of presenting an critical overview of the Addis Ababa Action Agenda. In the fourth section in sequence we elaborately present the outcome of the FfD 3 with regard to international tax cooperation and reduction of illicit flows. We conclude this paper with a detailed take on the implementation framework and way forward.

Domestic Resource Mobilisation and Key Challenges in Indian Context

Medium-term macro fiscal framework

The Millennium Development Goals (MDGs) were institutional in a context where long term development results were identified and resources were provided through India's traditional five year planning process. Thus, the Central Government allocated resources for initiatives to secure MDG targets in successive five year plans. States, too, prepared complementary plans. Initiatives such as Sarva Shiksha Abhiyan (SSA), National Rural Health Mission (NRHM), etc., pertinent to the MDGs, were then co-financed by the centre and the states through a negotiated process. The picture has now changed with the abolition of the Plan and Non-plan distinction in the expenditure framework and the reconstitution of the Planning Commission as NITI Aayog. The NITI Aayog is not seen to be a resource allocation institution unlike the Planning Commission. The resources are now deployed for different objectives of public policy through a different framework.

The erstwhile Planning Commission had two important fiscal responsibilities: first, to allocate money to the states in order for them to finance their Plan expenditures; and second, to provide a five-year fiscal-resource framework for the central Plan. Much has been made of the first, which has meant centralisation and the use of discretion by the Centre. Over the last decade, however, with the financial position of the states improving sharply, this dimension has become more an irritant than a regrettable necessity for most states. It is still pertinent in the case of the so-called special category states, but that reflects the absence of a coherent policy to secure the fiscal sustainability of these states without recourse to discretion. With such a policy in place, the problem will abate. If not, then there are a number of entities that can be entrusted with this discretionary power.

The second responsibility was based on the implicit assumption that the central Plan would be the principal vehicle driving public investment. This has long been invalid. The share of capital expenditure in total Plan expenditure has fallen from 68 per cent in 1983-84 to 21 per cent in the current fiscal year. The Centre is no longer a major provider of budgetary resources for public investment.

The abolition of the Planning Commission raises an important fiscal question: will we continue to plan in the old-fashioned way with a range of output targets, and an expenditure programme to achieve these targets specified over the next five years? If so, the current Plan and non-Plan expenditure categories will continue to hold. But it will be necessary then to specify what "Plan" expenditure means in today's India.

If we do away with the "Plan" conceptualisation of public expenditure, then the strategic context would need to be defined. There would be a need of a multi-year macroeconomic framework that specifies: (a) the desired real growth rate; (b) the medium-term share of public expenditure in gross domestic product; and (c) the medium-term shares of investment expenditure, transfers and consumption expenditure.[1] These aggregates will be specified based on multi-year political decisions that derive from the government's growth and development vision. It is essential to specify these, so that annual budgeting can be predictable, strategic and transparent.

In all modern economies fiscal budgeting is essentially a rolling medium-term exercise that specifies the above in the expenditure dimension. Together with a resource-mobilisation strategy, this constitutes a medium-term fiscal framework, with annual budgets reflecting largely the articulation of the medium-term in the immediate present. Policy attention is focussed on the framework, not on the budget. In India, it is exactly the opposite. The media, commentators and general public derive great entertainment from anticipating and discussing the annual Budget. For years, with fiscal planning essentially being a gestural exercise, this has meant that there has been no multi-year basis to fiscal planning. We have "Plan" and "non-Plan" expenditure categories, but these have no strategic or operational relevance. As a consequence, our fiscal performance has suffered in terms of predictability, effectiveness and credibility, and this has meant that governments have been punished by those who have borne the adverse consequences – from the rating agencies to the electorate. The previous National Democratic Alliance government and successive Finance Commissions recognised this challenge. The implementation of their recommendations means that an adequate apparatus to change this is at the disposal of the government. For more than 10 years, every annual Budget presents a medium-term macroeconomic framework, a medium-term fiscal policy and a fiscal-policy strategy statement. But the time and attention afforded to these is a fraction of what is afforded to the preparation of the annual Budget. Thus, the accounting exercise dominates the policy and strategic exercise. The political impetus to deliver change, that is at the heart of every new government, gets stymied when the cumbersome and antiquarian budget-making exercise commences its lumbering annual process.

The Scope for South-South Cooperation

South-South cooperation is an important complement for the resource mobilisation initiatives of the SDGs. As Chaturvedi (2016) shows, the development compact underpinning South-South cooperation has five pillars two of which are directly pertinent for the question of development financing.[2] A good example of this is cooperation in the health sector.

India has collaborated extensively with Brazil and Bangladesh to undertake joint research projects

to contain cholera and HIV (Chaturvedi, 2016). In the case of science and technology, India has collaborated with its neighbours in construction of microwave links with Nepal and Bhutan. So, by being an important provider of South-South cooperation to other countries in the region there is enough scope for India in areas where its own domestic efforts face challenges (Box 1). Examples include education, health, sanitation, urbanisation, gender equity and communication.

Addis Ababa Action Agenda: An Overview

The Addis Ababa Action Agenda (AAAA) is regrettably vague about actions to secure domestic public resources to address the development financing agenda for the Sustainable Development Goals (SDGs). There is no underlying analytical framework as to how:

- Gaps in Domestic Resource Mobilisation (DRM) for public spending are a constraint to securing the SDGs; and
- Whether the major challenges are to raise the level of public spending as percentage of Gross Domestic Product (GDP) or to implement expenditure switching policies that change the pattern of spending, or both.

It appears from Para 22 that the agenda seeks to enhance the tax-GDP ratio but this is not a definitive statement. This is important because, in effect, that is a normative decision to be taken regarding the size of the state. In India, for example, total tax revenues accruing to general government (General Government (GG) = Centre + states) are approximately 17 per cent of gross domestic product or GDP. The total GG fiscal deficit is 7 per cent. This means that GG accounts for about a quarter of GDP. Is this just right, too small or too big? The higher the tax-to-GDP ratio, the lower the amount available for firms and households to consume and save. The more GG borrows, the lower the savings available for private investment. This important policy question has been long ignored. It is time a clear policy

Box 1: Multilateral Cooperation and the International Solar Alliance (ISA)

India and France launched an International Solar Alliance (ISA) to boost solar energy in developing countries at the UN Climate Change Conference in Paris on 30 November 2016. International Solar Alliance is conceived as a coalition of solar resource rich countries to address their special energy needs and will provide a platform to collaborate on addressing the identified gaps through a common, agreed approach. The Paris declaration on International Solar Alliance states that the countries share the collective ambition to undertake innovative and concerted efforts for reducing the cost of finance and cost of technology for immediate deployment of competitive solar generation, financial instruments to mobilise more than US$ 1000 billion of investments needed by 2030 for the massive deployment of affordable solar energy and to pave the way for future solar generation, storage and good technologies for countries' individual needs.

ISA will work with partner countries in the identification of national opportunities to accelerate development and deployment of existing clean solar energy technologies, the potential for which largely remains untapped. To achieve the objectives, ISA will have five key focus areas:

a) Promote solar technologies and investment in the solar sector to enhance income generation for the poor and global environment;

b) Formulate projects and programmes to promote solar applications;

c) Develop innovative financial mechanisms to reduce cost of capital;

d) Build a common Knowledge e-Portal; and

e) Facilitate capacity building for promotion and absorption of solar technologies and R&D among member countries.

The Government of India (GoI) will support ISA by hosting its Secretariat for an initial period of five years and thereafter it is expected to generate its own resources and become self-financing. The total Government of India support, including putting normative cost of the land will be about Rs. 400 crore (US$ 62 million). The Government of India support of Rs. 175 crore (US$ 27 million) will be utilised for creating building infrastructure and recurring expenditure. It will be provided over a five year period from 2016-17 to 2020-21.

Source: http://isolaralliance.com/pdf/ISA-Working-Paper.pdf , and http://pib.nic.in/newsite/backgrounders.aspx?relid=0

stance on the size of GG is enunciated. If the size of GG is not too small, then this means, in effect, that the question for India is not how to mobilise incremental resources but;

- How to reduce the draft by the government on domestic savings by raising the tax-GDP ratio; and
- To explore possibilities for expenditure switching policies that target money towards SDGs by spending less in other areas.

This question is entirely side stepped by the AAAA and will, therefore, have to be addressed nationally.

The document elaborates considerably on international tax cooperation and reduction in illicit flows. We, therefore, address this separately in the next section.

Para 31, which is essentially a wordy jargon filled sentence, recommends reduction in "inefficient" fossil fuel subsidies. This is a laudable objective, but one that has substantially been achieved by India. What remains are targeted subsidies to incentivise use of cleaner fuels like natural gas and to phase out energy used for domestic cooking, etc., by the poor (Box 2).

Para 32 speaks of non-communicable diseases in one section and then focusses on a single topic-tobacco. India faces enormous epidemiological challenges from both communicable and non-communicable diseases. International cooperation on vaccines, retro-virals and other means of reducing the incidence of such diseases is of first importance. This will require substantial financing and the case for South-South and broader development cooperation to address this challenge is quite considerable. In this context, assessments will be undertaken by think-tanks in India in conversation with, among others, the Bill and Melinda Gates Foundation.

In the case of tobacco, India is already pursuing a fairly aggressive taxation policy. Other than as a standalone risk to health, this cannot be viewed as a proxy for overall health issues in India and in other developing countries as well.

Paras 33 and 34 essentially provide a wish list of things to be done and commitment to work on this wish list. Within this list, there are three areas of focus for India: Infrastructure, intergovernmental fiscal relations and the role of national, and regional and global development banking institutions.

International Tax Cooperation and Reduction in Illicit Flows

More than international aid, tax is important for development. The Addis Ababa Action Agenda (AAAA) uses the word 'tax' 35 times as compared to its use just four times in the Monterrey consensus.

AAAA says that governments will improve fairness, transparency, efficiency and effectiveness of the tax systems of the member's countries by broadening the tax base and continuing efforts to integrate informal sectors into the formal sectors of the economy. All this

Box 2: Direct Benefit Transfers (DBT) in Fuel Subsidies

The PAHAL (Direct Benefits Transfer of LPG – DBTL) scheme was earlier launched on 1 June 2013 and finally covered 291 districts. It required the consumer to mandatorily have an Aadhaar number for availing LPG subsidy. It covered nearly 10 crore consumers with over 3770 distributors across the three PSU Oil Marketing Companies with an aim to achieve the objective of efficient subsidy administration. An amount of Rs. 5400 crore was successfully transferred to more than 2.8 crore LPG consumers across the country. While preliminary results indicated that the scheme met its primary objective of curbing leakages in the distribution system, the speed at which it was rolled out and inclusion of low Aadhaar districts gave rise to consumer grievances. The modified scheme was re-launched in 54 districts on 15 November 2014 in the first phase and launched in rest of the country on 1 January 2015. The economic survey 2015-16 notes, "...the PAHAL scheme of transferring LPG subsidies via DBT reduced leakages by 24 per cent and seems to have excluded few genuine beneficiaries…" With DBT in place, the government identifies beneficiaries by linking households' LPG customer numbers with Aadhaar numbers to eliminate 'ghost' and duplicate households from beneficiary rolls.

Source: http://petroleum.nic.in/dbt/whatisdbtl.html ; Ministry of Petroleum and Natural Gas; and Economic Survey 2015-16, Government of India.

is proposed to be done through capacity building as part of Official Development Assistance (ODA). AAAA also promises to reduce illicit financial flows by 2030 again with a promise of its eventual elimination. This is proposed to be achieved by combating tax evasion and corruption. It also talks of opportunities for tax avoidance by inserting anti-abuse clauses in tax treaties. All these seem like declaration of pious intentions. It is unlikely that the Addis outcome will be able to solve the current problems of the developing countries in any significant manner.

Contrary to popular perception that capital flows from the developed world to the developing ones, that compete with each other in receiving such flows, several studies have shown that capital actually flows in the opposite direction. Although there may not be a particular fix on the quantum of such flows, it is reasonable to assume that the quantum is humongous (Global Financial Integrity (GFI) estimates that developing and emerging economies lost US$ 7.8 trillion in illicit financial flows from 2004 to 2013.) Much of such flows represent loot of natural resources, corruption, tax evasion and systemic tax avoidance through transfer pricing and other means.

And much of the blame for the current state of affairs may be laid at the doors of the Organisation for Economic Co-operation and Development (OECD), a club of 34 rich countries that, in effect, has been setting the standards of international tax for over half a century. OECD, in turn, had taken over the legacy from the work of League of Nations in the 1920s when the world was divided between the colonists and the colonies. Despite persistent criticism, the international architecture at the core remains the same with very little taxing power given to the source states and most of the taxing powers being retained by the residence countries. It is this state of affairs that results in most of the tax base erosion in developing countries, a fact recognised by the OECD, but ignored in the final suggestions for reforms following its base erosion and profit shifting project.

One of the most significant reasons for illegal financial flows, that drain the resources of the developing countries, is the existence of tax havens or international financial centres. These jurisdictions, as the Panama papers show, essentially trade in secrecy. International business companies are freely floated in these jurisdictions to help mask the identities of the real beneficial owners and OECD has done nothing to prevent the use of such companies. Its efforts are concentrated only on getting information. While information is important, it cannot be panacea for all the evils. Besides, as cynics have pointed out, the current system suits the developed world fine since the money ultimately ends up in their financial centres, be it London or Delaware. Moreover, some of the members of the OECD are themselves secrecy jurisdictions.

The OECD also continues to believe in the theory of multinational firms set up in different jurisdictions as separate entities, while the truth is that multinationals are multinationals because they can exploit the synergy. The arm's length standard set up by the OECD is, therefore, no longer fit for purpose, particularly when finding comparable for MNCS that deal with each other is next to impossible, in the context of growing importance of intangibles. The permanent establishment threshold set up by the OECD again can easily be avoided in the context of an international economy that relies more on services and intangibles. As a result, we are left with an international tax standard that is a patch up of complex rules and regulations and that benefit none except the big accounting firms that have a big say in determining any proposal emanating from the OECD.

From the perspective of the developing countries, therefore, the need of the hour is for a non-partisan organisation like the United Nations to take charge in setting the norms. What is actually happening now, as is shown by the Base Erosion and Profit Shifting (BEPS) work, is that standards are set by the developed nations through the OECD and the developing countries are then asked to enforce such standards and the ODA is often targeted at how these standards should be enforced. Developing countries are obviously unhappy with this state of affairs. The determined efforts of G-77 countries at the Addis conference to transform the current group of experts at the United Nations into a permanent body were, however, stymied by equally determined opposition from the developed world led by the USA, Germany and Japan on the ground that the same will duplicate the work done by the OECD and generate unnecessary bureaucracy. The OECD being responsible to its members, however, cannot be expected to be non-partisan.

A possible alternative could be some regional groupings to take the initiative and come up with models and solutions that suit their purpose and gradual expansion of the same in course of time as was done in the case of General Agreement on Tariffs and Trade (GATT). India being part of the BRICS and having its chair for 2016 can take a lead. There is a BRICS tax group set up in 2013 that promised to do a number of things, but seems to have gone in hibernation. May be it is time for us to reactivate the same.

Implementation Framework and Way Forward

To speak of an implementation framework for financing SDGs, prior to an elucidation of India's strategy for funding, is not appropriate. An implementation framework for the SDGs can only be worked out once the national SDGs strategy is complete. Transitively, a financing strategy for the SDGs can only be crafted once the implementation framework is in place. Therefore, in this section we set out five pillars around which such a financial strategy can be structured.

1. **A national medium-term macro fiscal framework that is consistent with the SDGs implementation framework:** As explained in the section II, the Government of India has moved away from the traditional distinction between plan and non-plan expenditure in the budgeting. There is a growing consensus that an integrated medium-term macro framework would need to be constructed as a modern fiscal rule.[3] There is, therefore, considerable opportunity to incorporate questions of SDGs financing into this framework. Areas of action would be:

    - The current target base system of revenue forecasting will be replaced with a medium-term revenue forecast. This forecast in turn will be based on the medium-term macro framework which would provide overall and sectoral growth and inflation consistent with the FRBM Act and the monetary policy framework.
    - It is unlikely that in India the Central Government will stop borrowing to consume even by FY 2020. Even so, investments made in the provision of peace and security relevant to the SDGs would continue to form the part of Central Government's current expenditure. Since these will be a hard budget constraint, the scope for public investment at the Central Government will continue to be limited. Public money will be leveraged through private financing for different purposes. It will be important, therefore, that such leverage also takes into account the need for financing SDGs.

2. **Calibration of vertical and horizontal devolution between the centre and the states based on the relative responsibilities of these levels of government with respect to SDGs**: In the second part of the medium-term macro framework here, the emphasis would be on identifying committed expenditure and, subject to budget constraints, the total fiscal space in the form of freely allocable expenditure available over the life of the framework.

    - It is expected that both committed and allocable expenditure will be assessed on the basis of new outcome budget, which are already been commissioned from spending departments by the NITI Aayog. The SDGs focus, in this context, should be on the outcome budgets and action then can be derived by increasing allocable expenditure for such purposes and reprioritising committed expenditure. This exercise will be important for SDGs pertaining to peace and security, infrastructure, rural development, water and sanitation, and poverty reduction.
    - The states of India are increasingly important fiscal players. For the past ten years, the states as a whole have not been incurring revenue deficit and there is continuous efforts to incentivise states that do incur deficits to reduce it; there has been considerable success on this score. Thus states will be the key drivers of public investment till FY 2020 and the conversation on SDGs, that require public investment (as opposed to current expenditure), will need to focus on the states. The NITI Aayog is the appropriate institution to coordinate such a conversation and ensure that states both own and incorporate the SDGs into their future public investment plans. To do this, the Fifteenth Finance Commission will be an important institution since it will calibrate: a) the vertical devolution between the Centre

and the States, and b) the horizontal devolution between the states of the divisible pool.

There is a huge opportunity to engage with Fifteenth Finance Commission to ensure that this calibration takes account of SDGs financing needs.

3. **In the case of social section spending, an urgent and fundamental review of factors underlying extremely low efficient outcomes in delivering universal health and education and clear identification of where such policy failures are a consequence of inadequate financing:** In the context of SDGs, a particularly acute problem in India is ensuring effective financing in the social sector (Table 1). It is well known that India has very low public spending on education and health. Despite the flurry of new initiatives by the current government, it remains low.

Table 1: Public Spending on Health and Education

Country	Public spending on education (% of GDP 2005-2014)	Health Expenditure (% of GDP, 2013)
Argentina	5.1	7.3
Brazil	5.8	9.7
India	3.8	4.0
Kenya	6.6	4.5
Nepal	4.7	6.0
South Africa	6.2	8.9

Source: World Human Development Report, 2015.

The outcomes, thus, achieved out of spending remains abysmally poor. Thus there is an urgent need to improve efficiency on the outcomes of public spending in the social sector. In a complex political economy like India, there could be several reasons why this may be the case. In the context of financing questions, we need to identify where inefficiency is directly related to insufficient public spending. It is important, therefore, that India confirms to spending significantly on general services to ensure that security and integrity of world's largest democracy is maintained and this is a necessity and desirable to secure the SDGs agenda. Political action to reduce the need to incur such expenditure can be explored through regional, bilateral and multilateral institutions which should be recognised as impacting SDGs. (What I try to say here is if world powers can persuade Pakistan to stop infiltration in India or China to stop supplying arms to Maoist movements, then this can be cool and give India extra money for spending.) In the absence of will, it should recognise that such spending is integral to SDGs for ensuring peace in the region.

4. **International cooperation to reduce illicit financial flows and other divergence of global finance away from sustainable development agenda**: On the AAAA tax cooperation, India can lead an initiative to come up with models and solutions to combat tax evasion that are better suited for developing countries. This is an important pillar for South-South cooperation and India should use every forum available in which it can share initiatives, including BRICS tax group, the G77, the G20, and South Asian Association for Regional Cooperation (SAARC).

5. **Remove obstructions to greater access to international finance for infrastructure and sustainable investment:** The need of the hour for many developing countries in securing SDGs is to magnitudinally increase infrastructure investment particularly sustainable infrastructure. To this end, there needs to be specific focus on ways to secure long term financing commercially, but without the excessive risk being in currently imposed international financial markets. Initiatives like International Solar Alliance is important, in this context, but more needs to be done to foster investment in the sectors like railways, urbanisation, water and sanitation, etc. In this context, India can leverage the recently set National Infrastructure Investment Fund as well as use its strong governance presence at the New Development Bank and the Asian Infrastructure Investment Bank to push for such institutions to expand investment in sustainable infrastructure. The SDGs can act here as powerful impetus for positive action on this score as it enables developing countries, like India, to show how the existing financing arrangements for investment in sustainable infrastructure detract from such countries availability to secure essential financing for the SDGs.

Endnotes

1 Roy (2014).

2 Chaturvedi (2016).

3 Roy (2016).

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Usual disclaimer: The opinions expressed in the paper are those of the author and do not necessarily reflect the views of the Institute.

Work Programme on SDGs

Research and Information System for Developing Countries (RIS), in collaboration with the Ministry of External Affairs (MEA), Government of India and NITI Aayog, Government of India, and with support from the UN in India, is spearheading a programme of national consultations among lawmakers, policymakers, academia, private sector and the civil society on the Sustainable Development Goals (SDGs). Under this work programme, in its first phase, RIS organised a series of Consultations on SDGs in India ahead of the formal adoption of the 2030 Agenda for Sustainable Development in September 2015 by the UN General Assembly. Panel discussions were organised on Southern perspectives alongside the Third International Conference on Financing for Development (FfD3) in Addis Ababa, Ethiopia in July 2015 and the UN General Assembly (Sustainable Development Summit) in September 2015 in New York.

NITI Aayog in partnership with RIS and UN in India organised the National Consultations on SDGs with first consultation focussing on Health and Education (SDGs 3 and 4) in February 2016; second focussing on Industrialisation and Employment (SDGs 8 and 9) and third on Sustainable Management of Water and Sanitation For All (SDG 6) in August 2016 in New Delhi. RIS has also organised eminent person lecture by H.E. President of Liberia, Madam Ellen Johnson Sirleaf and thematic dialogues on: WTO and SDGs (November 2015); nutrition and food security (February 2016); and Technology Facilitation Mechanism (March 2016) in partnership with key national and international think-tanks. RIS and UN have also launched this special volume on SDGs to explore perspectives from India and the Global South. For more information on RIS Work Programme on SDGs visit: http://sdg.ris.org.in/ or email at: dgoffice@ris.org.in.

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