Draft

Faster, Sustainable and More Inclusive Growth

An Approach to the 12th Five Year Plan

सत्यमेव जयते

Planning Commission

August 2011

Contents

Tables

Charts

Boxes

1

An Overview

1.1 The Indian economy, on the eve of the Twelfth Plan, is characterised by strong macro fundamentals, and a very good performance over the Eleventh Plan period, though clouded by some slowdown in growth in the current year, continuing concern about inflation and a sudden increase in uncertainty about the global economy. The objective of the Eleventh Plan was faster and inclusive growth and the initiatives taken in the Eleventh Plan period have resulted in substantial progress towards both objectives. Inevitably, there are some weaknesses that need to be addressed and also new challenges that need to be faced. Some of the challenges are themselves the consequence of the economy's transition to a higher and more inclusive growth path, the structural changes that come with it, and the expectations it generates. There are external challenges also arising from the fact that the global economic environment is much less favourable than it was at the start of the Eleventh Plan. These challenges call for renewed efforts on multiple fronts learning from the experience gained, and keeping in mind global developments.

1.2 In preparing the Approach Paper, the Planning Commission has consulted much more widely than ever before recognising the fact that citizens are now much better informed and also keen to engage. Over 950 civil society organisations across the country have provided inputs; business associations, including those representing small enterprises have been consulted; modern electronic and social media are being used to enable citizens to give suggestions. All State Governments, as well as local representative institutions and unions, have been consulted through five regional consultations. This process of consultation will be strengthened in the course of preparing the Twelfth Plan over the next few months.

Experience with Growth

1.3 The Eleventh Five Year Plan (2007/08 – 2011/12) had aimed at achieving faster and more inclusive growth. Rapid GDP growth, targeted at 9 percent per annum, was regarded necessary for two reasons: first, to generate the income and employment opportunities that were needed for improving in living standards for the bulk of the population; and second, to

generate the resources needed for financing social sector programmes, aimed at reducing poverty and enabling inclusiveness.

1.4 The economy has performed well on the growth front, averaging 8.2 per cent in the first four years. Growth in 2011-12, the final year of the Eleventh Plan was originally projected at around 9 per cent continuing the strong rebound from the crisis, which saw an 8.5 per cent growth in 2010-11. Instead, the economy has slowed down compared with the previous year – a phenomenon common to all major economies reflecting the fact that 2010 has a rebound from depressed levels in 2009. Growth in 2011-12 is likely to be around 8.0 per cent. The economy is likely to achieve an average GDP growth of around 8.2 per cent over the Eleventh Plan period, which is lower than the 9.0 per cent originally targeted, but faster than the 7.8 percent achieved in the Tenth Plan. This implies a nearly 35 percent increase in per-capita GDP in this period. It has also led to a substantial increase in government revenues, both at the Centre and the States, which has enabled a significant step-up of resources for the programmes aimed at inclusiveness. A healthy increase in aggregate savings and investment rates, particularly in the private sector, testifies to the strength of our economy as it enters the Twelfth Plan period.

1.5 The acceleration in growth in the Eleventh Plan period compared with the Tenth Plan is modest, but it is nevertheless a good performance, given the fact that a severe global economic crisis depressed growth in two of these five years, and also that India had the weakest monsoon in three decades in the year 2009. The slowdown in 2011-12 is a matter of concern, but it can be reversed if the investment climate is turned around and if fiscal discipline is strengthened.

Inclusiveness

1.6 Progress towards inclusiveness is more difficult to assess, because inclusiveness is a multi-dimensional concept. Inclusive growth should result in lower incidence of poverty, broad-based and significant improvement in health outcomes, universal access for children to school, increased access to higher education and improved standards of education, including skill development. It should also be reflected in better opportunities for both wage employment and livelihoods and in improvement in provision of basic amenities like water, electricity, roads, sanitation and housing. Particular attention needs to be paid to the needs of the SC/ST and OBC population, women and children as also minorities and other excluded groups. To achieve inclusiveness in all these dimensions requires multiple interventions, and success depends not only on introducing new policies and government programmes, but on institutional and attitudinal changes, which take time. A comprehensive assessment of outcomes on all these fronts during the Eleventh Plan is not possible at this point, because the data for recent years is

still not available. However, available evidence suggests that there have been gains on many of these fronts, even though there are shortfalls for which further work is needed.

1.7 An important consequence of the focus on inclusion during the Eleventh Plan has been the much heightened awareness about inclusiveness and empowerment amongst people. There is today a greater desire to access information about the rights and entitlements made available by law and policy, and eagerness to demand accountability from the public delivery systems. This augurs well for the future.

Inter-State and Inter-Sectoral Variations

1.8 One important feature of the growth experienced in the Eleventh Plan, which is relevant for inclusiveness, is that high rates of economic growth have been more broadly shared than ever before across the States. While most States have shown sustained high rates of growth, several of the economically weaker States have demonstrated an improvement in their growth rates. Amongst them are Bihar, Orissa, Assam, Rajasthan, Chhattisgarh, Madhya Pradesh, Uttarakhand and to some extent Uttar Pradesh.[1] According to available data, no State has averaged GSDP growth of less than 6 per cent during the Eleventh Plan period.

1.9 While the economically-weaker states are catching up in growth rates, there is growing concern about the backwardness of individual districts, several of which are located in States that are otherwise doing well. Many of these districts are also affected by Left-wing Extremism. The Backward Regions Grant Fund and various other regional initiatives have been specially designed to address this problem.

Progress in Reducing Poverty

1.10 Reducing poverty is a key element in our inclusive growth strategy and there is some progress in that regard. According to previous official poverty estimates, the percentage of the population living below the poverty line had declined by 8.5 percentage points between 1993/4 and 2004/5. Since the appropriateness of the poverty line was questioned in some quarters, the Government appointed an Expert Committee under the Chairmanship of the late Prof. Suresh Tendulkar. The Tendulkar Committee recommended a recalibration of the rural poverty line to make it more comparable with the urban poverty line, which it found to be appropriate. The application of the Tendulkar Committee poverty line provides a higher estimate of rural poverty

[1] *The improvement in this formerly low growth and low income States is evident in many cases over the Xth Plan period, and in some others, more so over the XIth Plan period. It should be emphasized that those States which picked up over the Xth Plan period, have continued to perform better in the XIth Plan. However, some formerly higher income and high growth States have shown slightly weaker growth over the XIth Plan period, most prominent of which are Karnataka and Tamil Nadu.*

and therefore also of total poverty, but if the new method is applied to the earlier years, as it should be, it shows that the percentage of the population in poverty declined from 45 per cent in 1993/94 to 37 per cent in 2004/05. Thus, poverty was declining at roughly 0.8 percentage points per year in the year before the Eleventh Plan.

1.11 The Eleventh Plan had set a more ambitious target of achieving a decline of 2 percentage points per year. Preliminary estimates using the latest NSS survey for 2009/10 suggest that the percentage of the population in poverty declined, at a slightly more rapid rate than before, by approximately 1 percentage point per annum, during the five-year period 2004/05 to 2009/10. Since 2009/10 was a drought year, and poverty in that year could have increased temporarily, the underlying rate of decline is probably more than one percentage point per year. It is also possible that the pace of poverty reduction has accelerated in the last two years of the Eleventh Plan period, since several Eleventh Plan programmes aimed at increasing inclusiveness would have begun to have a fuller impact. A summary assessment is that the pace of poverty reduction has accelerated, though it may still be short of the target. However, looking ahead, India is well poised to meet the Millennium Development Goal target of 50 percent reduction of poverty between 1990 and 2015.

1.12 One critical parameter to examine the degree of inclusiveness is to see what has happened to the real farm wages in the rural areas. This is because the largest number of poor, primarily landless workers, is in rural areas and the majority of them still rely on farm work for their livelihood. It is comforting to see that during the period 2007 to 2010 (calendar years), the average real wage rates have increased by 16 percent at an all India level. The growth was the fastest in Andhra Pradesh (42%) and Orissa (33%). Even in states like Bihar and Uttar Pradesh, real farm wages went up by 19 and 20 percent respectively, over the three year period.

Plan Programs for Inclusiveness

1.13 The Eleventh Plan gave a special impetus to several programmes aimed at building rural and urban infrastructure; and providing basic services, with the objective of increasing inclusiveness and reducing poverty. Some of these programmes were new, while others represented augmenting the existing initiatives. Thirteen such flagship programmes are listed in Box 1.

1.14 Most of these programmes are Centrally Sponsored Schemes, which are implemented by State Government agencies, but which are largely funded by the Central Government with a defined State Government share. The total expenditure on these schemes by the Central Government in 2011/12 (budget estimate) is Rs.188,573 crore, and the total expenditure during the Eleventh Plan period is almost Rs. 700,000 crore. As one would expect, the effectiveness of their implementation varies from State to State. Instances of misuse of funds are frequently

reported in studies and press reports, and these are a legitimate source of concern that needs attention. However, it must be kept in mind that while instances of misuse or leakage present serious problems, they do not necessarily imply that the overall impact of the programme is not positive. For example, MGNREGA, which was started in 2006-07 and extended to cover the whole country during the Eleventh Plan, has seen several instances of misuse of funds, but it has also notched up a remarkable success. There is a proliferation of Centrally Sponsored Schemes over a period of years. This has led to poor implementation, duplication, lack of convergence and sub-optimal results. There is an urgent need to transform the system and sharply reduce the number of schemes. This will enable more focused and effective implementation. A Committee under Shri B.K. Chaturvedi, Member, Planning Commission, has been appointed to review the entire gamut of Centrally Sponsored Schemes and make recommendations for rationalization and consolidation leading to reduction in their number.

Box 1

Flagship Development Programmes

Unit: Rs. crore

Sl. No.	Programme	Ministry/ Department	2007-08 Actual Expenditure	2011-12 BE	Total XIth Plan
1	MGNREGA	Rural Development	12,661	40,000	156,301
2	Indira Awas Yojana (IAY)	Rural Development	3,886	10,000	41,486
3	National Social Assistance Programme (NSAP)	Rural Development	3,104	6,158	23,536
4	Pradhan Mantri Gram Sadak Yojana (PMGSY)	Rural Development	6,500	20,000	65,002
5	NRHM	Health & Family Welfare	10,509	18,115	69,214
6	ICDS	Women & Child Development	5,193	10,000	38,980
7	Mid Day Meal (MDM)	School Education & Literacy	5,832	10,380	38,602
8	Sarva Siksha Abhiyan (SSA)	School Education & Literacy	11,477	21,000	77,576
9	JNNURM	Urban Development	5,508	13,700	48,485

Sl. No.	Programme	Ministry/ Department	2007-08 Actual Expenditure	2011-12 BE	Total XIth Plan
10	Accelerated Irrigation Benefit Programme (AIBP) and Other water resources programme	Water Resources	5,446	12,650	46,622
11	Rajiv Gandhi Gramin Viduyati Karan Yojana (RGGVY)	Power	3,913	6,000	25,913
12	Rajiv Gandhi Drinking Water Mission (Rural Drinking water) – NRDWP and Total Sanitation Campaign (TSC)	Drinking Water Supply	7,320	11,000	46,722
13	Rashtriya Krishi Vikas Yojana	Agriculture & Cooperation	1,200	7,811	18,550
GRAND TOTAL			**81,217**	**186,539**	**691,976**

1.15 With a people-centred, demand-driven architecture, completely different from the earlier rural employment programmes, MGNREGA has directly led to the creation of 987 crore person-days of work since inception. In financial year 2010/11, MGNREGA provided employment to 5.45 crore households generating 253.68 crore person-days. It has also successfully raised the negotiating power of agricultural labour, resulting in higher agricultural wages, improved economic outcomes and resulted in reduction in distress migration. This is not to deny that with better project design implementation leakages could be greatly reduced; and the assets so created could make a much larger contribution to increase in land productivity.

1.16 Reforms in implementation of plan schemes are a priority and should receive focussed attention in the Twelfth Plan. There is need for more flexibility in the design of the schemes to reflect the realities on ground across the States. Special provisions should be considered for encouraging innovation and special efforts to promote convergence at the level of implementation to prevent duplication and to create synergies that improve the quality of outcomes. A detailed assessment of the broad nature of the reforms needed is provided in Chapter VI.

Demographics

1.17 The country's total population, as recorded in Census 2011, at 1.21 billion, is slightly more than what was forecast. But the growth has decelerated from 1.97 per cent per annum between 1991 and 2001, to 1.64 per cent per annum between 2001 and 2011. It has also declined in almost every State including those of the populous Gangetic plains. The deceleration reflects a much-needed decline in the Total Fertility Rate (TFR) which is estimated to have fallen to 2.6 and is expected to decline to 2.3 in the first half of the present decade. The Southern States have reached, or are close to reaching, the replacement level of fertility. Fertility levels in the northern states are also falling, but are much higher than the replacement level.

1.18 India has a younger population as compared to other countries, particularly the large developing countries. As a result, the labour force in India is expected to increase by 32 per cent over the next twenty years, while it will decline by 4 per cent in industrialised countries and by nearly 5 per cent in China. This "demographic dividend" can add to growth potential, provided two conditions are fulfilled. First, much higher levels of health, education and skill development must be achieved. Second, an environment must be created in which the economy not only grows rapidly, but also expands good quality employment/livelihood opportunities to meet the needs and aspirations of the youth.

Employment and Livelihood

1.19 For growth to be inclusive it must create adequate livelihood opportunities and add to quality employment commensurate with the expectations of a growing labour force. As noted above, India's young age structure offers a potential demographic dividend for growth, but this potential will be realised only if the extent and quality of education and skill development in new entrants to the workforce is greatly enhanced. One of the most remarkable things brought out by the 66th round NSSO survey on Employment (2009/10) is that the number of young people in education, and therefore out of the workforce, has increased dramatically causing a drop in the labour participation rate.[2] The total number of young working-age (15-24) people who continued in educational institutions doubled from about 30 million in 2004-05 to over 60 million in 2009-10.

[2] *In the age group of 5–14 years, 89.3 per cent of children were in school in 2009-10, up from 82.4 per cent in 2004-05. Further this increase was higher for girls, rising from 79.6 per cent in 2004-05 to 87.7 per cent in 2009-10. In the 15–19 years age group, 59.5 per cent of young people were in the educational system in 2009-10 as compared to 46.2 per cent in 2004-05. Once again, the increase was more for girls, from 40.3 to 54.6 per cent. In the next higher age group of 20–24 years, 22.5 per cent of boys and 12.8 per cent of girls were still in the educational system in 2009-10 against only 14.9 and 7.6 per cent respectively in 2004-05.*

1.20 The survey also shows that between 2004/05 and 2009/10, the overall labour force expanded by only 11.7 million, because of the much larger retention of youth in education, and also because of lower labour force participation among working-age women. However, over the same period, 18 million job opportunities were created on current daily status basis. Thus, in absolute terms, unemployment came down by 6.3 million; and the unemployment rate which had increased from 6.06 percent in 1993-94 to 7.31 percent in 1999-2000 and further to 8.28 percent in 2004-05, came down to 6.60 in 2009-10.

1.21 The lower growth in the labour force is not expected to continue in future and we can assume that much larger numbers of educated youth will be joining the labour force in increasing numbers during the Twelfth Plan and in the years beyond. The clear implication of this is that the pace of job/livelihood creation must be greatly accelerated. Part of this must come from a significant boost to the manufactured sector of the economy, such that it grows at a rate that is faster than most other parts of the economy. However, this may not be enough, in part because not all categories of manufacturing are labour intensive. Although GDP from manufacturing increased at 9.5% per annum between 2004-05 and 2009-10 along with some increase in employment in the organised manufacturing sector, this survey suggests that overall employment in manufacturing actually declined during this period. The implied shake-out of labour from the un-organised manufacturing sector needs to be studied in detail and steps taken so that the obvious potential of the MSME sector as a source of jobs/livelihoods is realised fully.

1.22 The 66th round NSSO Survey of Employment shows that the vast majority of new jobs created between 2004-05 and 2009-10 was in casual employment, mainly in construction. While such jobs are often more attractive for rural labour than casual work in agriculture, there is a potential for an accelerated pace of creation of more durable rural non-farm jobs/livelihood opportunities. Such job opportunities could come from faster expansion in agro-processing, supply chains and the increased demand for technical personnel for inputs into various aspects of farming that is undergoing steady modernisation, and also the maintenance of equipment and other elements of rural infrastructure. The service sector too has to continue to be a place for creation of quality jobs/livelihood opportunities, in both rural and urban areas.

Agriculture

1.23 A weakness in the economic performance thus far is that growth in the farm sector (agriculture & allied activities), though better than in the Tenth Plan, remains short of the 4 percent Plan target. The farm sector has grown at an average rate of around 3.2 per cent during the first four years of the Eleventh Plan and assuming conditions remain favourable in 2011, the

average farm sector growth in the Eleventh Plan period may be a little over 3 per cent. This is a marked improvement from the average growth of about 2 per cent in the Tenth Plan. Still, with half of our population dependent on agriculture & allied activities, we need faster farm sector growth to benefit poor farmers, many of whom are women. The below target growth in this sector is one of the reasons for increase in food prices over the last two years. Global development experience, especially from the BRIC countries, reveals that one percentage point growth in agriculture is at least two to three times more effective in reducing poverty than the same degree of growth emanating from non-agriculture sector.

1.24 Since agriculture is a State subject, the Centre will have to work hand in hand with the States to bring coherence in policies and strategies. Overall investment in agriculture, which had dipped to less than 10 per cent of agri-GDP in 2002-03 has been substantially raised and today stands at more than 21 of agri-GDP. Higher levels of investments in agriculture, both by the public and private sector can yield much better results if the reforms are undertaken to streamline not only the incentive structures for the farmers, but also the institutional framework in which agriculture and related agencies operate. Seeds and irrigation are priority areas, which can be catalysts for raising productivity on the supply side. On the demand side, there is urgent need to remove most of the controls that have denied a unified and seamless all India market for most of agri-products. Finding the most effective ways of ushering in these changes must be a key priority area in the Twelfth Plan.

Health

1.25 The Eleventh Plan had drawn attention to the fact that India's health outcome indicators continue to be weaker than they should be, at our level of development. The Plan had therefore expressed the necessity of allocating additional resources to health and laid down monitorable targets for parameters such as infant mortality (IMR), maternal mortality (MMR), institutionalised delivery, extent of full immunisation, etc. Data on these parameters, available for the first three years of the Eleventh Plan, show some improvement. The Infant mortality Rate (IMR) has fallen from 57 in 2006 to 50 in 2009. The percentage of deliveries in institutions has increased from 54 per cent in 2006 to 73 per cent in 2009, while the Maternal Mortality Rate (MMR) has come down by 32 points to 212 (2007-2009). These are marked improvements but their rate of decline is lower than our targets. We must accelerate the pace of progress in this area in the Twelfth Plan.

1.26 The Eleventh Plan had noted that the total public expenditure on health in India by Centre and the States was less than 1 per cent of GDP and it needed to be increased to 2 or 3 percent. The process has begun and the percentage is estimated to have increased to around 1.4 per cent in 2011/12 (BE). If expenditure on drinking water & sanitation in rural areas, which are critical for better health outcomes, is included, the percentage would be higher at 1.8

percent. Regardless, a larger allocation of resources will definitely be needed in the Twelfth Plan to achieve the objective. We should aim to increase total health expenditure as percentage of GDP to 2.5 per cent by the end of Twelfth Plan.

1.27 It must be emphasised that financial resources are not the only constraint. Shortage of health professionals at all levels has become a serious impediment to achieving an expansion in the public provision of health services. There has been inadequate attention to improving our education and training capacities in this area. There are also problems of accountability of personnel even when these are recruited. These lacunae will take time to rectify, but the Twelfth Plan must give a special emphasis to solve this problem.

Education

1.28 The Eleventh Plan had articulated the need for expanding educational facilities and improving quality of education, as key instruments for achieving faster and inclusive growth. There has been notable success in expanding capacity but the challenge of raising quality still persists.

1.29 There has been improvement in the extension of primary education, both in regard to enrolment and in reduction of dropout rates. The Right to Education (RTE) Act, which became operational in 2009, has laid a solid foundation on which we need to build. A major achievement is that most children are now in school. The ASER 2010 report shows that for the age group 6–14 years in all of rural India, the percentage of children who are not enrolled in school has dropped from 6.6 per cent in 2005 to 3.5 per cent in 2010. The proportion of girls in the age group 11–14 years who were out of school has also declined from 11.2 per cent in 2005 to 5.9 per cent in 2010. However, the absolute numbers of children who are out of school remains large. While this needs to be reduced, it is not unreasonable to state that access is now more or less universalised. We now confront the greater challenge of improving the quality of school education. This means extensive and improved teacher training, upgrading curriculum and enforcing of accountability in teachers' attendance. As increasing number of children finish elementary school, there will be need to expand capacity in secondary and higher secondary schools. Envisaging universalisation of secondary education by 2017 should be a priority in the Twelfth Plan.

1.30 The Eleventh Plan had outlined a three fold strategy of expansion, equity and excellence for higher education. The Central Government introduced a programme of creating new Central Universities and other institutions of higher learning in the Eleventh Plan. This effort has begun, but it will have to be continued into the Twelfth Plan period to reach its full potential. Revitalisation of the State Universities and Colleges is also critical. These universities suffer from

underfunding by State Governments with as many as 50 percent of faculty positions unfilled, forcing frequent resort to contract teachers and an adverse impact on the quality of teaching.

1.31 The task of achieving excellence in higher education demands academic reforms to provide greater flexibility and choice for the students, and strengthening of research activity in Universities by establishing mutually-reinforcing linkages between teaching and research. Faculty shortages need to be tackled through innovative ways such as technology-enabled learning, collaborative information and communication technologies (ICT). As an experiment in achieving higher quality, the Government is proposing Innovation Universities which will have greater autonomy and freedom. This effort needs to be supplemented by funding Centres of Excellence in existing universities, which may yield greater results in a shorter time.

1.32 Resource constraints will make it difficult to meet the need of expanding higher education entirely through the public sector. Not all private educational institutions are of good quality and some are quite inferior. Minimum standards will have to be ensured. But free entry will, in the end, automatically weed out the poor quality institutions. Private initiatives in higher education, including viable and innovative PPP-models, will therefore be actively promoted. The current "not-for-profit" prescription in the education sector should be re-examined in a pragmatic manner so as to ensure quality, but without losing focus on equity.

Infrastructure Development

1.33 Inadequate infrastructure was recognised in the Eleventh Plan as a major constraint on rapid growth. The Plan had, therefore, emphasized the need for a massive expansion in investment in infrastructure based on a combination of public and private investment, the latter through various forms of public-private-partnerships. Substantial progress has been made in this respect. The total investment in infrastructure which includes roads, railways, ports, airports, electricity, telecommunications, oil gas pipelines and irrigation is estimated to have increased from 5.7 per cent of GDP in the base year of the Eleventh Plan to around 8.0 per cent in the last year of the Plan. The pace of investment has been particularly buoyant in some sectors, notably telecommunications, oil & gas pipelines; while falling short of targets in electricity, railways, roads and ports. Efforts to attract private investment into infrastructure through the PPP route have met with considerable success, not only at the level of the Central Government, but also at the level of the individual States. A large number of PPP projects have taken off, and many of them are currently operational in both the Centre and the States.

1.34 Compared to other developing countries, India has been slow to urbanise, but the pace of urbanisation is expected to accelerate over the next two decades. The 2011 Census also shows an increase in the urban population from 27.8 per cent in 2001 to 31.2 per cent in 2011, and it is likely to exceed 40 percent by 2030. This would generate a heavy demand for better

quality infrastructure in urban areas, especially water, sewerage, public transport and low cost housing. Since it takes time to create urban infrastructure, we must introduce a sufficiently long term focus on urban planning in the Twelfth Plan.

1.35 The Twelfth Plan must continue the thrust on accelerating the pace of investment in infrastructure, as this is critical for sustaining and accelerating growth. Public investment in infrastructure will have to bear a large part of the brunt of meeting infrastructure needs in backward and remote areas to improve connectivity and expand the much needed public services. Since resource constraints will continue to limit public investment in infrastructure in other areas, PPP-based development needs to be encouraged wherever feasible. It is necessary to review the factors which may be constraining private investment, and take steps to rectify them. PPP, with appropriate regulation or concern for equity, can also be encouraged in the social sectors, such as health and education. Several State Governments are already taking steps in this direction.

The Energy Challenge

1.36 The energy needs of rapid growth will pose a major challenge since these requirements have to be met in an environment where domestic energy prices are constrained and world energy prices are high and likely to rise further. For the GDP to grow at 9 percent, commercial energy supplies will have to grow at a rate between 6.5 and 7 percent per year. Since India's domestic energy supplies are limited, dependence upon imports will increase. Import dependence in the case of petroleum has always been high and is projected to be 80 percent in the Twelfth Plan. However, even in the case of coal, import dependence is projected to increase as the growth of thermal generation will require coal supplies which cannot be fully met from domestic mines.

1.37 Rational energy pricing is critical for both effective demand management and a healthy supply response. It is relevant for demand management, because energy users have no incentive to economize if energy is under-priced. It is also relevant for expansion of domestic supply, because under-pricing of energy imposes a large burden on the energy producers reducing the resources that should accrue to them for financing new investments in these areas. In the longer term, we must move beyond fossil fuels to non-conventional energy. However, these new energy sources are significantly more expensive than fossil fuels and increased dependence on these fuels will mean higher per unit energy costs.

1.38 The Integrated Energy Policy, which was approved in 2009, had enunciated principles of energy pricing that equalize domestic energy prices with the prices of imported energy, while allowing for targeted subsidy to the needy and poor. While we have taken some steps in this direction, our energy prices still remain significantly below the world prices. This is true for both

petroleum prices (other than petrol) and coal. It is also true of electricity, since regulators, often under political pressure, are not setting tariffs in a rational manner to reflect normative costs. The Twelfth Plan must address the challenge of aligning domestic energy prices with the global price trends. This is not easy to do in a short time span, but it can be done gradually over a period of time. It must be emphasized that our ability to sustain high growth in the Twelfth Plan will depend critically upon our ability to make this adjustment. The poor will need subsidy, which should be strictly targeted, but energy prices in general cannot be de-linked from global price levels, particularly in a situation where import dependence is increasing.

Natural Resource Management – Water, Land & Forests

1.39 Economic development will be sustainable only if it is pursued in a manner which protects the environment. With acceleration of economic growth, these pressures are expected to intensify, and we therefore need to pay greater attention to the management of water, forests and land.

1.40 Management of water resources poses increasingly difficult challenges that will require attention in the Twelfth Plan. The total quantity of usable fresh water annually available in India is fixed, but its demand from expanding agriculture and other sectors is increasing. Water resources in many parts of the country are under severe stress leading to excessive exploitation of ground water. There is some scope for increasing water availability. While these opportunities must be fully exploited, the real solution has to come from greater efficiency in water use.

1.41 Agriculture accounts for 80 percent of water needs at present, and there is considerable scope for increasing efficiency of water use in this area. This requires better management of water in command areas of large and medium irrigation projects. It also requires putting in place more holistic aquifer management strategies. Separation of electricity feeders for agriculture and domestic use can help limit the availability of electricity for pumping ground water thus breaking the vicious cycle between free energy and excess use of groundwater. Wherever this has been done in combination with large-scale watershed programmes, there is evidence that groundwater levels have recovered.

1.42 Normally, efficient use of scarce resources requires appropriate pricing, but pricing of water is a sensitive issue. This problem can be solved by providing 'lifeline' water supplies for drinking and cooking at very low prices. While charging appropriately for additional water use by domestic consumers. There is a stronger case for rational pricing reflecting the scarcity of water for commercial and industrial use. There is also a strong case for rational pricing of water for agricultural purposes. The proportion of water recycled in urban areas, and by Indian

industry needs to be significantly increased. This will happens if supply for commercial purposes is appropriately priced.

1.43 Even if we succeed in bringing about a major rationalisation of water prices, this by itself will not lead to optimal use. For this, a rational pricing must be accompanied by regulatory measures to ration water to different agricultural users, and stronger measures to discourage pollution. It is estimated that up to 13 per cent of drinking water in rural areas contains chemical contaminants, including fertilizer run-offs (particularly urea and its decomposition products). Contamination of drinking water is the principal cause of health disorders, particularly amongst children.

1.44 The availability of land has become a major constraint on expansion of infrastructure, development of mineral resources, industrialisation and urbanisation. The present arrangements for acquisition of land, and also for change in land use are archaic, often unfair and non-transparent. They need a comprehensive review. A new modern law is needed to govern the acquisition of land for industrial use, infrastructure development or urbanisation. This should also contain provisions for resettlement and rehabilitation. A draft legislation has been put in the public domain before a final view is taken. Finalisation of this legislation, with an appropriate balance between the need to protect the interests of current land owners or those dependent on it for livelihood, and the broader objective of development is critical.

1.45 The protection and strengthening of our natural forests is another critical area. This is also linked to conservation of soil and treatment of watersheds, which have a bearing on the way we deal with our water resources, particularly drinking water. They also impact on the availability of energy for the economy, since most of the country's coal resource lies under the forest. Since rapid economic growth will require a commensurate growth in energy supply and most of our electricity generation is expected to be coal based, there are potential conflicts between protecting the forests and ensuring an adequate supply of energy to the economy. It will be necessary to evolve mechanisms through which a suitable balance can be struck between the energy requirements of development and the need for environmental protection. These issues are discussed at length later in this paper.

Implementation, Accountability and Governance

1.46 An over-arching challenge that requires much greater attention in the Twelfth Plan is that of ensuring better implementation and improved accountability. There are four aspects of governance that are important.

1.47 First, better governance is crucial for translating the large outlays of our flagship programmes into enduring outcomes on the ground. Interaction with stakeholders reveals that

while there is general appreciation that these programmes have the right objectives, their implementation on the ground is poor. Implementation of programmes can be improved through a multi-faceted approach relying on professionalization of public service delivery, Total Quality Management, innovative use of IT and other technologies which improve monitoring and supervision. It can also improve through greater emphasis on social mobilisation and capacity building, strengthening of local institutions, and building deeper partnerships with civil society organisations and the community to determine the needs and aspirations of the people.

1.48 Second, implementation in many areas, particularly in infrastructure development, involving large projects, is held up for a variety of reasons. Coordination needed across different agencies to facilitate progress in project implementation is often lacking and can lead to long delays and cost over-runs. "Project management' capabilities must be improved for the country to get better returns from public investment in infrastructure and also in the social sectors. Project management, to deliver on time and within cost, is a learnable capability that can be institutionalised, as demonstrated by the development experiences of Japan, Korea, Singapore and China. A nation-wide drive to improve project management must be an integral part of the Twelfth Five Year Plan.

1.49 Third, is the broader issue of how to rid the system of corruption, which is both morally abhorrent and imposes economic costs? A number of initiatives need to be urgently pursued. Several legislative measures are needed. These include the establishment of an effective *Lokpal*, introduction of a law on public procurement to transparency, and the creation of a legislative framework governing the functioning of regulatory institutions, to ensure both accountability and independence.

1.50 Finally, to combat corruption, it is imperative to ensure speedy prosecution and trial in corruption cases. The long delays in the judicial process are an important factor behind the growing cynicism about the rule of law in our system. Reforms in the legal process need to be put in place without further delays.

The Global Context

1.51 India's growth prospects depend largely on an ability to tackle supply side constraints in the domestic economy, but it cannot be viewed in isolation from developments in the world economy, if only because our economy is now much more globally integrated. The share of exports of goods & services in GDP has increased from 14 per cent in 2000/01 to 22 per cent in 2010/11 and India is now viewed as an important destination for FDI.

1.52 Global economic prospects are clouded with uncertainty. The world has avoided a prolonged downturn that was at one stage feared as a possible consequence of the 2008 crisis. The industrialised countries have resumed positive growth after contracting in 2009, but growth in these countries remains anaemic with serious macro-economic imbalances and concerns about sovereign debt. Emerging markets are growing much more robustly, and India has been one of the leaders in this process. However, concern about – sovereign debt and fiscal unsustainability in industrialised countries – not only weakens the prospects of an early return to robust growth in these countries, but also creates uncertainty about the export markets in industrialised countries. An adverse development globally, which affects India directly, has been the rise in oil prices, and also the prices of other commodities, including food. Economic management over the next two to three years will have to cope with this uncertainty.

1.53 Taking a longer view, however, the changes taking place in the world economy, with a shift in economic strength towards emerging markets and especially in Asia, are inherently favourable for India. Table 2.3 presents a projection of world economy over the next two and a half decades. Industrialised countries are likely to grow at about 3.5 percent per year in nominal US Dollar terms between 2010 and 2025, while developing and emerging economies are projected to grow at around 8 percent. Within this group, developing Asia is projected to grow, again in nominal US Dollar terms, at around 10 percent per year. These projections are, of course, subject to the usual qualifications that attend long-term forecasts, but they are not out of line with the current perceptions. The advanced economies' share in global GDP is projected to fall from 65 per cent in 2011 to 51 percent by 2025, while the share of emerging economies is projected to increase from 35 per cent to about 49 percent over the same period. This is shown in Table 1.3 below:

Table 1.3

Structure of Global GDP (in current US $ Trillion)

	2000	2011	2016	2020	2025
World GDP	**32.2**	**68.7**	**90.5**	**110.5**	**140.5**
Advanced Economies	25.7 (79.7%)	44.4 (64.6%)	53.3 (58.9%)	61.1 (55.3%)	71.7 (51.1%)
Developing & Emerging	6.5	24.3	37.2	49.4	68.8

	(20.3%)	(35.4%)	(41.1%)	(44.7%)	(48.9%)
of Which					
Developing Asia	2.3 (7.3%)	10.5 (15.2%)	17.4 (19.3%)	26.6 (24.1%)	40.7 (28.9%)
of which India	0.5 (1.5%)	1.9 (2.8%)	3.6 (4.0%)	5.8 (5.2%)	10.0 (7.1%)
Sub-Saharan Africa	0.3 (1.0%)	1.2 (1.8%)	1.7 (1.9%)	2.5 (2.2%)	3.9 (2.8%)
West Asia & North Africa	0.8 (2.5%)	2.8 (4.0%)	3.8 (4.2%)	5.0 (4.5%)	7.1 (5.0%)
Latin America & Caribbean	2.1 (6.6%)	5.5 (8.0%)	7.4 (8.2%)	9.7 (8.8%)	13.3 (9.5%)

[Figures in parentheses denotes share of world GDP]

Source: The World Economic Outlook database of the International Monetary Fund. This data up to 2010 in most cases (up to 2009 and earlier in a few) is actual data. Thereafter the figures up to 2016 are projections by the IMF. The projections for India and other countries beyond 2016 have been made internally in the DPPP Division of the Planning Commission.

1.54 The important point emerging from these projections is that India has the potential to become the third largest GDP in the world in two decades. However, to realise this potential we must ensure sustained rapid growth. China has grown around 10 per cent per year in real terms for 30 years and is now expected to slow down. India is currently behind China, but the evidence suggests that India has now developed the potential for sustained rapid growth over the next two decades, provided supportive appropriate policies are put in place. These policies must promote and support changes in many sectors. Our infrastructure, our industrial sophistication, our management of cities, and also our management of a whole range of knowledge promoting institutions, particularly the universities, will have to change dramatically. Institutional changes will be necessary. These changes take time to bring about, but it is important to begin now, if we want the economy to occupy its rightful potential in the world.

Prospects for the Twelfth Plan

1.55 The message emerging from this overview is that the economy has gained in strength in many dimensions and is therefore well placed to achieve faster, sustainable and more inclusive growth. Having achieved 8.2 percent growth in the Eleventh Plan, it is reasonable to aim at 9 percent growth for the Twelfth Plan. As pointed out in Chapter II, this is a feasible target from a macro-economic perspective but it cannot be viewed as an assured outcome. Global economic conditions are very uncertain and energy prices are likely to remain high. To achieve rapid growth, the economy will have to overcome constraints posed by limited energy supplies, increase in water scarcity, shortages in infrastructure, problems of land acquisition for industrial development and infrastructure, and the complex problem of managing the urban transition associated with rapid growth. Greater efforts also need to be made in agriculture, health and education to ensure inclusion of the most excluded and sometimes invisible parts of our population.

1.56 These difficulties suggest that a 9 percent growth target for the next five years is ambitious. But it is not impossible, if we have the political will to do what is necessary. Economic reforms over the last twenty years have resulted in the citizens of India having high expectations. The Twelfth Plan has to meet the aspirations of millions of young men and women. This cannot be done by following a business-as-usual approach. All sections of society – government, farmers, businesses, labour and concerned citizens – have to adopt newer, more effective ways of pursuing their activities, so that we can collectively achieve our lofty goals.

2

Macro-Economic Framework

2.1 The global crisis of 2008/09, and its aftershocks, has created conditions whereby the Twelfth Plan will be launched in a less benign and a more uncertain macroeconomic environment than the Eleventh Plan. There is no doubt that India has weathered the global crisis much better than most other countries in the world, but it certainly has not been immune. More importantly, the policy measures taken to meet the crisis have left residual issues which will need to be addressed, if we are to achieve our objective of faster, sustainable, and more inclusive growth. In this chapter we examine, the feasibility of accelerating growth beyond the level achieved in the Eleventh Plan. Subsequent chapters explore some of the key sectoral constraints that have to be overcome to achieve faster growth, and also the steps needed to ensure that growth is both inclusive and sustainable.

Drivers of Growth in the Twelfth Plan

2.2 There are several potential drivers of growth that suggest it may be possible to accelerate GDP growth in the Twelfth Plan beyond the 8.2 per cent level achieved in the Eleventh Plan. However, each of these needs to be nurtured and built upon with appropriate policy interventions to achieve the desired growth objective.

Macro-Economic Fundamentals

2.3 The high rates of investment (over 36 per cent of GDP) and private sector savings (34 per cent of GDP) constitute strong macro-economic fundamentals supporting high growth. However, there has been a slowdown in the pace of increase in private corporate investment, in part due to the uncertainties flowing out of the global crisis and continued difficulties in world markets, and in part due to the rise in global energy and commodities prices. The uncertainties in global markets are expected to continue. Domestic inflationary pressures, particularly as reflected in rising wages, add to the uncertainty in this regard.

2.4 Until recently, there was also a steady improvement in the government savings in the form of a steady reduction in the revenue deficit. This process was interrupted by the crisis of 2008/09 and the revenue deficit increased sharply thereafter, reflecting the reduction in taxation designed to counter the negative effect of the crisis, and also the decision not to raise oil prices for domestic consumers in line with rising oil prices in global markets. However, the process of restoring fiscal discipline has begun and is projected to be continued in the Twelfth Plan. This should keep macro-fundamentals broadly in line with what is needed for faster growth.

Impact of Economic Reforms

2.5 The policy environment created by the economic reforms implemented over the past twenty years has had two very important consequences. First, it has provided entrepreneurs with the flexibility they need to make their own decisions on technology, location, size of investment, etc. all of which have a bearing on productivity and competitive strength. Second, the creation of a competitive market environment has pushed Indian industry to improve quality and achieve cost efficiency. This process has been greatly enhanced by the steady opening of the economy to foreign trade and to direct investment flows. Exports of goods and services, as a percentage of GDP have increased from 14 per cent in 2000/01 to 22 per cent in 2010/11, indicating the increased openness of the economy in the past few years and the consequent competitive pressure on the Indian industry. More recently, India has entered into several economic cooperation arrangements with countries in East Asia, South and South East Asia, which will further strengthen the competitive environment.

Development of a Dynamic Private Sector

2.6 The past ten years have also seen the development of a dynamic private sector, which has grown in strength and is well positioned to undertake large investments needed to propel the economy to a faster growth path. Corporate balance sheets are quite robust, indicating a favourable base for expansion in investment in future. The larger Indian enterprises in manufacturing and services are also investing abroad, including in the industrialised countries, signalling an expansion of India's economic footprint in the global economy. Several studies based on direct measures of productivity show that sections of India's manufacturing sector have gained significantly in productivity over the last two decades. These productivity gains have become evident only in recent years, indicating a significant lag between the initial introduction of the reforms and their impact on the ground. This may partly reflect the fact that the process of reforms itself was gradual. However, these gains must be consolidated further if the economy is to be firmly established on a high growth path.

2.7 Indian companies in many sectors have shown capacity for innovation, which needs to be nurtured and strengthened as we move into the Twelfth Plan. This calls for a greatly expanded programme of Research & Development (R&D), as well as other innovations, to lift Indian manufacturing to a higher level. It is important to emphasise that dynamism is not limited to large companies. Many companies in the MSME sector have also expanded and shown the capacity for innovation (See Chapter 8). However, much more needs to be done to strengthen and nurture the potential performance of this sector. Particularly important in this context are improved infrastructure services, including reliable power and better logistics for transport, as also better financial access, including development of institutions that can provide start-up finance for small and potentially innovative businesses.

Management and Labour Skills

2.8 Entrepreneurial capacity in the private sector is matched by an impressive pool of managerial talent and an increasingly skilled workforce. However, experience has shown that rapid growth in the recent past has been accompanied by shortages of specific skills and increasing rates of employee turnover. The MSME sector is particularly hard hit in key areas of skills. Therefore, much more needs to be done in the area of skill development to adequately complement the potential expansion in the level of economic activity. The expansion underway in educational institutions needs to be accelerated and greater attention needs to be paid to the quality and appropriateness of skills being imparted. The government has taken a number of steps in this area and these need to be strengthened in the Twelfth Five Year Plan.

Aspirational Drivers

2.9 The aspiration for change amongst the entire population, especially the young, is an important feature that can help push the economy to a higher growth path. These aspirations have arisen because of the demonstrated success in many sectors, and are also fuelled by increase in school attendance and the hope that better education will lead to better job opportunities. However, while the aspirational drive is a force that can push the economy towards greater achievements, it is also true that if not adequately fulfilled, it can lead to frustration and cynicism. A major challenge in the Twelfth Plan is how to ensure that the performance of the economy remains ahead of ever rising expectations.

2.10 These drivers of growth are to some extent offset by some important critical constraints arising from the supply side. The most important of these relate to (i) availability of energy, (ii) growing evidence of problem with water availability, (iii) slower than required improvement in farm output and in the logistics of farm produce, (iv) difficulties relating to land acquisition for industry and infrastructure development, and (v) the lack of a credible and fair system for exploitation of mineral resources. The scope for overcoming these constraints is discussed at length in subsequent chapters of the Approach Paper.

Growth Targets for the Twelfth Plan

2.11 The Planning Commission has explored two alternative targets for economic growth in the Twelfth Plan. The first is a restatement of the Eleventh Plan target of 9 per cent growth, which has yet to be achieved. The second is an even higher target of 9.5 per cent average growth for the Twelfth Five Year Plan. Several macro-economic models have been used to examine the feasibility of these targets in terms of internal consistencies and inter-sectoral balances. The detailed results obtained from these models will be published separately. In this section, we present a tentative assessment of the implications of these two alternative growth targets

2.12 The sectoral growth rates broadly consistent with the 9 per cent and 9.5 per cent alternatives are presented in Table 2.1. The 9 per cent target requires a significant acceleration in growth in agriculture; in electricity, gas and water supply; and also in manufacturing. Agricultural growth has always been an important component for inclusiveness in India, and recent experience suggests that high GDP growth without such agricultural growth is likely to lead to accelerating inflation in the country, which would jeopardise the larger growth process. However, even if such agricultural growth is achieved, it is unlikely that the agricultural sector will absorb additional workers. Thus, the main onus for providing additional jobs to the growing labour force will rest on manufacturing and construction and on the services sectors. The target set for the mining sector, mainly reflecting additional production of coal and natural gas, is also very demanding, but is necessary to meet the primary energy requirements without resorting to excessive imports.

2.13 As shown in Table 2.1, taking the growth rate to 9.5 per cent would require much faster growth in the manufacturing, as well as in electricity, gas and water supply sectors. The feasibility of achieving such large acceleration in key sectoral performance needs to be considered carefully before the growth targets for the Twelfth Plan are fixed. This is particularly true for the energy sector where, as outlined in Chapter 3, supply constraints could be severe.

Table 2.1:

Sectoral Growth Rates - Previous Plans and Target for Twelfth Plan

		IXth Plan	Xth Plan	XIth Plan	XII th Plan	
					9%Target	9.5%Target
1	Agriculture, forestry & fishing	2.5	2.3	3.2*	4.0	4.2
2	Mining & quarrying	4.0	6.0	4.7	8.0	8.5
3	Manufacturing	3.3	9.3	7.7	9.8	11.5
4	Elect. gas & water supply	4.8	6.8	6.4	8.5	9.0
5	Construction	7.1	11.8	7.8	10.0	11.0
	6. Trade, hotels & restaurant	7.5	9.6	7.0		
	7. Transport, storage & communication	8.9	13.8	12.5		
6 -7	Trade, hotels etc. + Transport, communication, storage	8.0	11.2	9.9	11.0	11.2
8	Financing, insurance, real estate & business services	8.0	9.9	10.7	10.0	10.5
9	Community, social & personal services	7.7	5.3	9.4	8.0	8.0
	Total GDP	**5.5**	**7.8**	**8.2**	**9.0**	**9.5**
	Industry	4.3	9.4	7.4	9.6	10.9
	Services	7.9	9.3	10.0	10.0	10.0

*Note: * It is likely that on revision of farm sector GDP growth rates for the previous year and an expected good harvest in 2011/12 the average for the Eleventh Plan may be higher at 3.3–3.5 per cent.*

Investment and Savings Requirements

2.14 A basic macro-economic feasibility check is to establish whether the investment and savings rates and the current account deficit required for achieving these growth targets are broadly feasible. Unless this balance is achieved, there is a danger that higher growth will only be obtained at the expense of unacceptable inflation. Ensuring macro-economic balance is a key aspect of medium term inflation management, though of course, many other issues come in for short term management. The current situation of high inflation and tightening of monetary policy at the domestic level and uncertainty in the global financial markets require a careful appraisal of the saving investment prospects for the Twelfth Plan period. The relevant information is presented in Table 2.2.

2.15 The investment required to achieve 9 per cent growth in the Twelfth Plan calls for some increase from the levels already achieved. The investment rate (which equals gross domestic capital formation adjusted for errors and omissions as a percentage of GDP) is estimated to have increased to 36.4 per cent of GDP in the Eleventh Plan as compared to 31.8 per cent in the Tenth Plan. Nonetheless, the average rate of growth in the Eleventh Plan at 8.2 per cent was not much greater than the average 7.8 per cent achieved over the Tenth Plan period. One obvious reason for this is the dislocation caused by the global crisis.

2.16 There was also a purely domestic factor at play. In the Ninth Plan (1997/98 to 2001/02) the rate of GDP growth was subdued at 5.5 per cent and the incremental capital output ratio (ICOR) was, notwithstanding comparatively lower investment rates, rather high at 4.5, as it also was in the first two years of the Tenth Plan (2002/03 and 2003/04) at 4.9. This flowed from slower growth in domestic demand during these years, and as a result India had a persistent current account surplus for three successive years from 2001/02 to 2003/04. There was thus some slack in the system, which got utilized in the Tenth Plan period, and this should be borne in mind when viewing investment and growth rates realized in the Tenth Plan.

2.17 The current account balance slipped back into negative in 2004/05 and averaged (–) 0.9 per cent of GDP in the last three years of the Tenth Plan. On account of the large surpluses in the first two years of the Tenth Plan, the average current account deficit for the five year period was nil. The Eleventh Plan period did not start out with the benefit of a slack in the system, as did the Tenth. One consequence of this was that despite the high investment rates that were realized during the closing years of the Tenth, and early years of the Eleventh Plan, inflation came to be a persistent problem.

2.18 While there are specific sectoral bottlenecks that explain some of the inflationary pressures, at the aggregate level, resolving these bottlenecks requires additional investment. Hence, in order to sustain high rates of growth of 9 per cent or higher, while maintaining moderate inflation, investment has to be higher than in the past, especially in areas where

supply side bottlenecks could trigger inflation. Thus the average investment rate needed during the Twelfth Plan period is estimated to be 38.5 per cent of GDP for the 9.0 per cent growth scenario with 4.5–5.0 average inflation. It would have to rise as much as 41.4 per cent of GDP for the 9.5 per cent growth scenario with 5.0–5.5 rate of inflation.

2.19 The rate of fixed capital formation increased rapidly during the Tenth Plan. It averaged around 28.4 per cent of GDP over the Tenth Plan period as against 23.2 per cent of GDP in the Ninth Plan. It had risen to 32.9 per cent of GDP in 2007/08, after which it declined through the years of the crisis to 29.5 per cent (provisional) in 2010/11. Even so, the rate of fixed capital formation is likely to average around 31 per cent of GDP in the Eleventh Plan, which is 2.5 percentage points of GDP higher than in the Tenth Plan. As pointed out above, the pick up in the average rate of growth in the Eleventh Plan period was not fully commensurate with this increase partly due to external developments. Further in order to sustain high growth while keeping inflation within moderate limits, it is imperative to expand the productive potential of the economy at a faster rate. As a result, the rate of fixed capital formation needs to improve to around 33.5 per cent of GDP over the Twelfth Plan period, in order to achieve an average economic growth rate of 9.0 per cent. This is feasible considering that a fixed capital formation rate of 32.9 per cent was actually achieved in 2007/08.

2.20 The likely break-up of fixed capital formation by investing sector shows some interesting features:

(i) Fixed capital formation in the household sector (which, in addition to agriculture and residential construction, includes practically all the micro and small enterprises) has been rather stable, and can be projected to increase to 12.0 per cent of GDP in the Eleventh Plan. For this to happen, the flow of financial resources to these sectors has to increase significantly. This requires not only expansion of the reach of the formal banking sector, but also revitalisation of the micro finance and other innovative financial institutions.

(ii) Fixed capital formation in the private corporate sector increased sharply to over 14 per cent of GDP in 2007/08 (the main reason for the peaking of fixed investment in the country in that year) before moderating to around 11 per cent in the last two years of the Eleventh Plan. Prospects for private corporate investment in the Twelfth Plan period depend upon many factors, which include India's overall macro-economic environment, particularly fiscal deficits and interest rates, the domestic investment climate and India's relative attractiveness as an investment destination compared with other countries. It is difficult to predict how private investment will behave, but with slightly optimistic assumptions one can envisage private corporate fixed capital formation averaging around 12.5 per cent of GDP during the Twelfth Plan.

(iii) The public sector (government and PSUs) will have to contribute its share to raising the rate of fixed capital formation to the desired levels. Table 2.2 projects that fixed capital formation from this sector needs to improve from an average 8.3 per cent of GDP in the Eleventh Plan to an average 9.1 per cent of GDP in the Twelfth Plan for the nine per cent economic growth scenario. The additional investment of 0.8 percentage points should be directed largely into infrastructure sectors like energy, roads, other transport, irrigation, watershed management, etc.

2.21 The savings needed to finance this level of investment are expected to come from a modest improvement in the savings rate of the household sector, from 23.2 per cent of GDP in the Eleventh Plan to 24 per cent in the Twelfth Plan. Private corporate savings are expected to increase from an average of 8.2 per cent of GDP in the Eleventh Plan to 8.5 per cent in the Twelfth Plan. A much stronger performance is needed in public sector savings, up from 2.5 per cent of GDP in the Eleventh Plan to 3.7 per cent in the Twelfth Plan. Public enterprises, which are a sub-component of public savings, had done reasonably well in terms of savings performance during the Tenth, but have slipped a bit in the Eleventh Plan, and their contribution is being projected to improve slightly as a percentage of GDP in the Twelfth Plan. However, Government Administration, which has negative saving, needs to improve its performance from -1.3 per cent in the Eleventh Plan to -0.2 per cent in the Twelfth Plan. This improvement is only possible if fiscal discipline is restored; and the Centre and the States succeed in containing revenue deficits.

2.22 As far as financing the current account deficit is concerned, the two scenarios have been generated with the same constraint that the current account deficit should not exceed 2.5 per cent of GDP. The current account balance actually averaged nil in the Tenth Plan and deteriorated in the Eleventh Plan to an average deficit of 2.4 per cent, mainly because of higher deficits in the later years, amounting to 2.6 per cent of GDP in 2010/11 and about the same in 2011/12. It is desirable for prudent management of the external account, that we restrict the CAD to an average below 2.5 per cent over the Twelfth Plan period. We can exceed this level for a year or two, but for the five year period as a whole we should work to a limit of 2.5 per cent of GDP, particularly so in the uncertain and volatile global financial conditions that are likely to persist for some time.

2.23 It should not be difficult to secure the capital inflows necessary to finance a level of CAD of 2.5 per cent of GDP, relying on stable long term Foreign Direct Investment (FDI) flows. But for this to happen, it is also necessary to ensure that policies relating to foreign investment are appropriately tailored to encourage such flows Indeed, the likelihood is that external capital inflows may exceed the financing requirements indicated by the CAD. During the Tenth Plan and the first two years of the Eleventh Plan, external commercial borrowings (ECBs) and external trade credits expanded sharply. While this allayed all concerns regarding the

sustainability of our external account and contributed substantially to the positive image of the country globally, it did create fairly serious problems in domestic macro-management. There are indications that a similar situation may obtain as we go into the Twelfth Plan. It will be necessary, therefore, to carefully monitor not just the CAD, but also the build-up of private external debt. As shown in Table 2.2, both the investment and saving rates required for the 9.5 per cent GDP growth scenario are much higher. Taking into account the need to limit reliance on external financing to a prudent level, and also considering practical limitations on the amount of additional public savings and investment that can be mobilised, it would be better to fix the growth target for the Twelfth Plan at an average 9.0 of GDP.

Table 2.2

Broad Macro-Economic Parameters - Previous Plans and Targets for Twelfth Plan

		IXth Plan	Xth Plan	XI th Plan	XII th Plan	
					9.0	9.5
1	Investment Rate (Gross Capital Formation adjusted for errors and omissions)	24.6	31.8	36.4	38.7	41.4
2	Fixed Investment *of which*	23.2	28.4	30.9	33.5	35.5
	Household Sector	9.9	11.7	11.6	12.0	12.0
	Private Corporate Sector	6.6	9.6	11.0	12.4	13.5
	Public Sector	6.6	7.1	8.3	9.1	10.0
3	Savings Rate *of which*	23.7	31.7	34.0	36.2	38.9
	Household Sector	20.5	23.2	23.2	24.0	24.5
	Private Corporate Sector	4.0	6.4	8.2	8.5	9.2

	Public Savings *of which*	-0.8	2.0	2.5	3.7	5.2
	Govt. Admin.	-4.9	-2.6	-1.3	-0.5	0.8
	Public Enterprises	4.0	4.6	3.8	4.0	4.5
4	Current Account Balance *of which*	-0.6	0.0	-2.4	-2.5	-2.5
	Trade Balance	-2.6	-2.5	-5.0	-4.5	-4.5
	Capital Account Balance	2.1	3.5	3.8	5.0	5.0
5	WPI Inflation Rate	4.9	5.0	6.0	4.5-5.0	5.0-5.5

Growth Vs Inflation

2.24 The emergence of inflationary pressure in the closing years of the Eleventh Plan has drawn attention to the possibility of a growth-inflation trade-off, raising concern whether aiming for a higher rate of growth at this stage may further fuel inflation. This issue is best addressed by distinguishing between short term and medium term policy.

2.25 There is no doubt that an effort to expand demand to push growth beyond the level consistent with the supply potential will lead to inflation. This is because production capacity of the economy is fixed in the short run, and domestic supply bottlenecks will ensure that an increase in production to meet higher demand can only be achieved at higher prices. The short term problem is further exacerbated by globally high prices of oil and other commodities. In these circumstances, there can be a trade-off between inflation control and growth in the sense that monetary and fiscal policy aimed at containing inflation by compressing domestic demand, to stay within the limit of constrained supply, can reduce domestic output in several sectors and therefore reduce growth in the current year.

2.26 The situation is quite different in the medium term where adoption of a higher growth target for the Plan is meant to trigger action to tackle the supply-side bottlenecks. To the extent that a higher growth target leads to measures that relax supply side constraints, it will increase the supply potential of the economy, which can only moderate inflationary pressures given a level of aggregate demand. Since the Plan takes into account the macro balancing needed for 9 percent growth, it provides a framework for managing aggregate demand in line with the potential growth in supply. The real problem is that if 9 percent growth on the supply side is

not realised, then monetary and fiscal policy will have to adjust to ensure that aggregate demand does not exceed the level of potential output. In other words, it is not the targeting of 9 percent growth which might produce inflation, but a failure to adjust demand, when we are unable to achieve what we want on the supply side. This is an argument for remaining vigilant during the Plan, and tailoring the expansion of demand to the realised expansion on the supply side. It is not an argument for not targeting a higher supply side response.

Financing the Public Sector Plan

2.27 Having established the macro-economic feasibility of 9 per cent GDP growth in terms of investment–saving balances and the current account deficit, it is necessary to consider the likely size of the Public Sector Plan. A detailed assessment of the size of the Central and State Plans will be finalised only at the time of finalisation of the Twelfth Plan. A provisional assessment of resource availability for the Centre has been made by the Working Group on Centre's Resources. This is presented in Table 2.3 (which shows absolute value in rupees) and Table 2.4 (which shows the same data as a percentage of GDP) below.

Table 2.3

Projection of Centre's Resources for the Twelfth Five Year Plan (2012-17)

(Figures in Rs Crore at Current Prices)

Sl No	Description	2011-12 (BE) Base Year	2012-13	2013-14	2014-15	2015-16	2016-17	XIIth Plan Total
1	Tax Revenue net to Centre	664,457	837,216	1,004,659	1,175,451	1,363,523	1,574,869	5,955,718
2	Non-Tax Revenue	125,435	112,620	128,387	146,361	151,683	155,627	694,678
3	Non-Debt Capital Receipts	55,020	56,027	54,471	55,178	55,930	56,785	278,391
4	Fiscal Deficit	412,817	421,606	412,095	404,441	463,085	530,233	2,231,461
5	Aggregate Resources	1,257,729	1,427,469	1,599,612	1,781,431	2,034,222	2,317,514	9,160,248

	(1+2+3+4)							
6	Non-Plan Expenditure	816,182	921,082	1,016,307	1,109,819	1,208,801	1,300,879	5,556,888
7	Gross Budgetary Support for Plan	441,547	506,387	583,305	671,612	825,421	1,016,635	3,603,360
7a	Central Assistance to States/UTs	106,026	121,930	140,219	161,252	191,890	230,268	845,558
7b	Central Plan	335,521	384,458	443,086	510,361	633,531	786,367	2,757,802
8	IEBR	256,936	293,641	335,589	383,531	438,321	500,938	1,952,020
9	Plan Resources for the Centre	592,457	678,099	778,675	893,892	1,071,852	1,287,305	4,709,822
10	Gross Domestic Product	8,980,860	10,283,085	11,774,132	13,481,381	15,436,181	17,674,428	68,649,207

Note: These figures are tentative and subject to revision when the final report of the Working Group on Centre's Resources for the Twelfth Plan become available.

Table 2.4

Projection of Centre's Resources for the Twelfth Five Year Plan

(as percent of GDP)*

Sl No	Description	2011-12 (BE)	2012-13	2013-14	2014-15	2015-16	2016-17	XIIth Plan Average
1	Tax Revenue Net to Centre	7.40	8.14	8.53	8.72	8.83	8.91	8.68
2	Non-Tax Revenue	1.40	1.10	1.09	1.09	0.98	0.88	1.01
3	Non-Debt Capital Receipts	0.60	0.54	0.46	0.41	0.36	0.32	0.41
4	Fiscal Deficit	4.60	4.10	3.50	3.00	3.00	3.00	3.25

5	Aggregate Resources (1+2+3+4)	14.00	13.88	13.59	13.21	13.18	13.11	13.34
6	Non-Plan Expenditure	9.09	8.96	8.63	8.23	7.83	7.36	8.09
7	Gross Budgetary Support for Plan	4.92	4.92	4.95	4.98	5.35	5.75	5.25
7a	Central Assistance to States/UTs	1.18	1.18	1.19	1.20	1.25	1.30	1.23
7b	Central Plan	3.74	3.74	3.76	3.78	4.10	4.45	4.02
8	IEBR	2.86	2.86	2.85	2.84	2.84	2.83	2.84
9	Plan Resources for the Centre	6.60	6.59	6.61	6.63	6.94	7.28	6.86

**The projections here assume 9 per cent real GDP growth and 5 per cent GDP inflation.*

2.28 The projections in Table 2.5 envisage Gross Budgetary Support for the Plan increasing from 4.92 per cent of GDP in 2011-12 to 5.75 per cent of GDP by the end of Twelfth Plan period. The increase in the GBS as a percentage of GDP over a five year period is only 0.83 per cent of GDP. There are several sectors where Plan allocations must increase as a percentage of GDP, notably health, education and infrastructure. Preliminary work shows that allocations for these sectors should ideally increase by around 1.5 percentage points of GDP. Given the limited increase projected in the Central GBS, this implies strict prioritization will have to be enforced, which implies resources for other sectors will expand more slowly than GDP.

2.29 The reason for the limited scope to increase GBS can be seen from the projected movement in the four components (items 1 to 4 in Table 2.5) that determine total availability of resources:

(i) The Net Tax Revenue for the Centre is expected to increase from 7.40 per cent of GDP in 2011-12 (BE) to 8.91 per cent of GDP in 2016-17, an increase of 1.51 percentage points.

(ii) Non-Tax Revenues are expected to fall from 1.40 per cent of GDP in 2011-12 to 0.88 per cent of GDP in 2016-17 (largely because of the absence of any prospects of large revenues as from spectrum proceeds).

(iii) The contribution of Non-Debt Capital Receipts (mainly dis-investment proceeds) is also expected to fall, partly because the scope for disinvestment is now limited if government equity cannot be diluted below 51 per cent.

(iv) The fiscal deficit is expected to fall from 4.6 per cent of GDP to 3.0 per cent of GDP in line with the Government's fiscal consolidation plan.

2.30 The net effect of the above trends it that although net tax revenues will be higher by about 1.51 percentage points of GDP, aggregate resources for the Centre (item 6 of Table 2.5) will actually fall from 14.01 per cent of GDP in 2011-12 (BE) to 13.11 per cent of GDP in 2016-17.

2.31 Thus, while the total availability of resources is expected to fall as a percentage of GDP, the size of GBS is projected to increase, because non-Plan expenditure is projected to fall as a percentage of GDP from 9.09 in 2011-12 to 7.36 per cent in 2016-17. The assumptions underlying the projected decline in non-Plan expenditure are obviously crucial for financing the public sector plan.

Non-Plan Expenditure

2.32 The Non-Plan Expenditure implied in the above projections declines from 9.09 per cent of GDP in the base year of the Twelfth Plan (2011-12) to 7.36 per cent of GDP in the terminal year of the Twelfth Plan (2016-17). This implies an average annual growth of around 10 per cent in nominal terms (or about 5 per cent in real terms). Non-Plan expenditure consists of interest payments, defence expenditure, pay and allowances, pensions, subsidies and others. The specific assumptions in these categories are as follows:

(i) Interest payment is forecast on the basis of projected growth of debt with interest rate 8.7 per cent on annual incremental borrowings keeping in mind the target for the reduction of fiscal deficit.

(ii) Defence expenditure is projected to fall from 1.83 per cent of GDP in the base year to 1.56 per cent of GDP in the terminal year. This is based on defence revenue and defence capital expenditure increasing annually, in nominal terms, by about 7.5 per cent and 15.0 per cent respectively. Since defence expenditure is already very low as a percentage of GDP, this projection may be conservative.

(iii) Pay and allowances are projected to grow at an annual rate of 7 per cent in nominal terms as there will be little expansion in government employment, and there may not be any impact of the new Pay Commission over this period.

(iv) Pension expenditure is projected to grow at an annual rate of 9 per cent, which is the level assumed by the 13th Finance Commission.

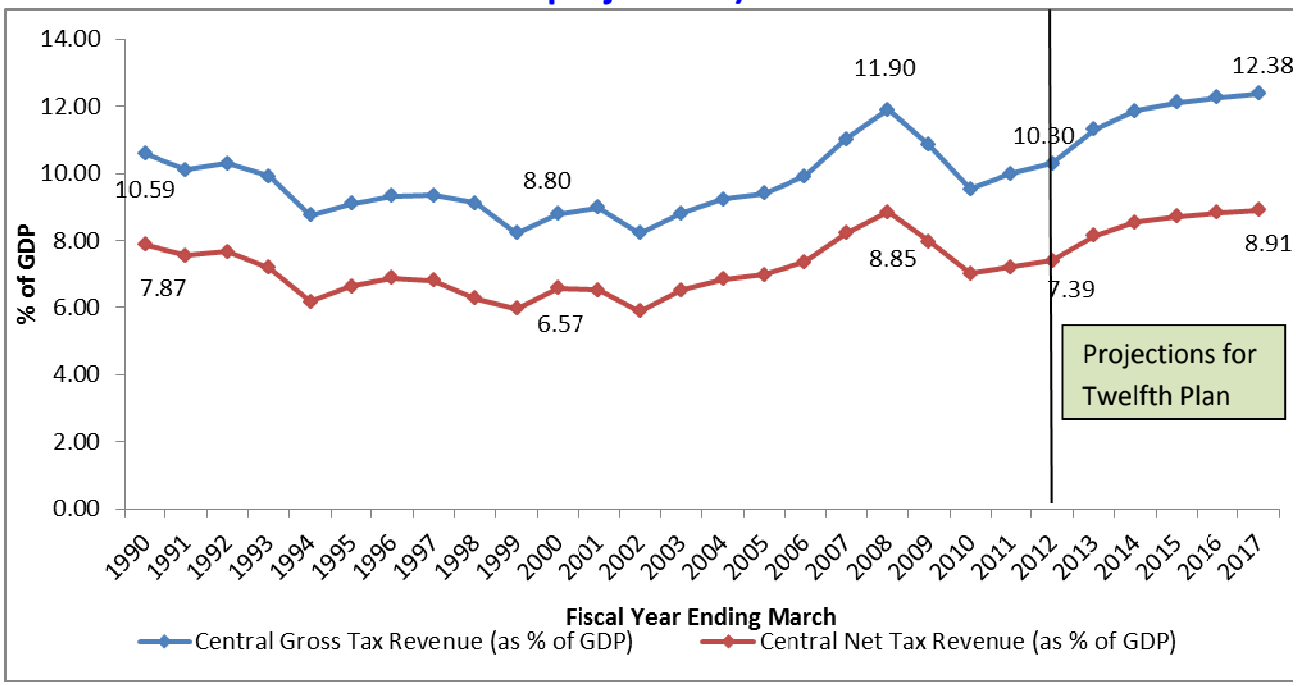
(v) Subsidies, account for 18.8 per cent of the total projected Non-Plan expenditure during the 12th Plan and are projected to decline from an estimated 1.6 per cent of GDP in 2011-12 (BE) to 1.24 per cent of GDP in the terminal year. The ability to reduce subsidies is critical from the resource point of view, since in the past, subsidies have been rather high as a percentage of GDP. They increased from 2.27 per cent of GDP in 2006-07 to 4.04 per cent of GDP in 2008-09, partly because of non-adjustment of oil prices and clearing of part dues. Subsidies in 2011-12 (BE) are expected to be 1.6 per cent of GDP, but it is possible that the BE estimate may be exceeded if oil prices are not adjusted further. If the subsidy figures in 2011-12 do exceed the budget estimates, the projected reduction over the Twelfth Plan would be much sharper.

2.33 It is evident from the above that effective targeting of subsidies to contain them is critical for achieving the Plan resource target. The only alternative would be to raise additional tax resources so as to achieve a tax-GDP ratio higher than average 12.0 per cent of GDP, which is what is implied in the above projections. This is not very difficult to achieve given what we have achieved in the past (see figure 2.1 below):

Figure 2.1:

Trends in Tax Revenues at the Centre

(1990 to 2017, including projections)



2.34 Gross Tax Revenues of the Centre were 10.6 per cent of GDP in 1990-91, but declined for several years as custom duties and income tax rates were reduced. However, they rose again after 2001-02, reaching a peak of 11.9 per cent in 2007-08. The tax ratio declined thereafter, because of the tax reduction introduced as part of the stimulus to reach 9.5 per cent of GDP in 2009-10. However, the trend has reversed again, and the gross tax-GDP ratio at the Centre was 10.0 per cent in 2010-11, further projected to be 10.36 per cent of GDP in 2011-12. This positive trend is expected to continue over the Twelfth Plan period. The projections therefore involve going above the previous peak of 11.9 per cent in 2007-08, but only moderately so. If we want a larger plan size, we could perhaps aim at a tax rate of 13.0 per cent of GDP. This could be achieved if critical tax-reforms in the pipeline become a reality in the coming years. The Goods and Services Tax, in particular, could also make the economy more competitive and help accelerate growth to the levels being targeted in the Twelfth Plan.

Financing Private Investment

2.35 Since more than two-thirds of the investment in the economy is by the private sector (households and corporate), it is necessary to ensure that the financial system is able to translate the otherwise favourable macroeconomic investment-savings balances into effective financing of the private sector investment needed for 9 per cent GDP growth. For this, we need a financial system capable of mobilising household savings and allocating them efficiently to meet the equity and debt needs of the fast expanding private corporate sector. This depends upon the efficiency of the financial system as a whole, which at present consists of a large number of financial institutions, such as banks, non-bank finance companies, mutual funds, insurance companies, pension funds, private equity firms, venture capital funds, angel investors, micro-finance institutions etc.

2.36 Special attention must be paid to the financing needs of private sector investment in infrastructure. Infrastructure investment (defined as electricity, roads and bridges, telecommunications, railways, irrigation, water supply and sanitation, ports, airports, storage and oil-gas pipelines) will need to increase from about 8 per cent of GDP in the base year (2011-12) of the Plan to about 10 per cent of GDP in 2016-17. The total investment in infrastructure would have to be over Rs. 45 lakh crore or $ 1 trillion during the 12th Plan period. Financing this level of investment will require larger outlays from the public sector, but this has to be coupled with a more than proportional rise in private investment. Private and PPP investments are estimated to have accounted for a little over 30 per cent of total investment in infrastructure in the Eleventh Plan. Their share may have to rise to 50 per cent in the Twelfth Plan.

2.37 Some important steps that need to be taken in the Twelfth Plan period are as follows:

(i) Equity markets are now well regulated. However, pension and insurance reforms have been pending and need to be undertaken on a fast-track basis. Mutual funds, insurance and pension funds are not only efficient routes through which household savings can be mobilised for corporate investment, but also vehicles that provide financial security to a large section of our population, hitherto excluded from the benefits of modern financial services.

(ii) A large part of household savings are currently absorbed by the government to finance the fiscal deficit. As fiscal consolidation is undertaken and household savings remain high, more funds are likely to be available for corporate debt investment. The creation of a vibrant and liquid corporate bond market should be taken up on priority basis. Reform of the government securities market is also essential for the establishment of a Government Securities (G-Sec) yield curve for all maturities against which corporate bonds can be priced. The creation of public debt management office outside the RBI has been under consideration and should be

expedited to free RBI from the role of a debt manager, and to facilitate building up of institutions and use of technology to allow an integrated bond market to develop.

(iii) Since investment in infrastructure has to increase as a percentage of GDP and about 50 per cent of the investment is projected to be in the private sector, the institutional mechanisms for supporting such investment deserves strong support. The Finance Ministry has announced guidelines for establishing infrastructure debt funds. This will help infrastructure companies to refinance short term bank debt with long term debt thereby freeing banks to finance new corporate investment. This will not only help leverage private investment in infrastructure, through speedier financial closure of public private partnerships, but also crowd-in private investment to propel Indian economy to a high growth path.

(iv) The public sector banking system needs to achieve economies of scale through both capital infusion and consolidation. If government ownership of equity in public sector banks cannot be diluted below 51 per cent, there is no alternative to providing budget resources to build up the capital of the public sector banks.

(v) Financial inclusion still remains a matter of concern. Until now, the approach was to open more and more rural branches, which involves very high costs. Fortunately, mobile and information technology permits the use of the banking correspondents' model to improve financial access for ordinary households in under-served areas. This must be expedited in the Twelfth Plan.

2.38 The main conclusion that emerges from this chapter is that despite the slowdown in growth in the current year, GDP growth target of 9 per cent for the Twelfth Plan is feasible from a macro-economic perspective. However, while growth at that pace is feasible, it cannot be said to be a forgone outcome. There are considerable uncertainties in the short-term in the global economy, and also formidable supply constraints in energy and some other sectors on the domestic front. However, while there are possible downsides to this scenario, we should aim for an average 9 per cent GDP growth for the Twelfth Five Year Plan at this stage. We should however, build in some flexibility in our planning so that at the time of Mid-term Appraisal of the Twelfth Five Year Plan, we could consider raising the target rate of growth, if the growth environment improves, and policy reforms, which could raise the growth potential of our economy, become a reality by that time.

3

Energy

3.1 Energy is a vital input for production and rapid growth of GDP will need to be supported by an increase in energy consumption. This is especially so in India, where large sections of the population are still without adequate access to commercial energy. In this Chapter, we examine the likely energy requirement of 9 per cent growth and make an assessment of its feasibility and the implications for various aspects of energy policy including energy pricing.

Projected Energy Demand

3.2 The extent of the increase in energy requirement over the Twelfth Five Year Plan depends on the elasticity of energy demand with respect to GDP, which has been falling over time and is currently around 0.80. Allowing for some further decline in the elasticity, a GDP growth rate of 9 percent per year over the Twelfth Plan will require energy supply to grow at around 6.5 percent per year. The ability to meet this energy demand depends on our ability to expand domestic production in critical energy sub sectors, notably petroleum and coal, and meeting the balance requirement through imports.

3.3 The pattern of energy demand that may be needed to support 9 percent GDP growth is shown in Table 3.1. The total energy requirement (in terms of million tonnes of oil equivalent) is projected to grow at 6.5per cent per year between 2010-11 and 2016-17. This is based on the assumption that the energy elasticity will decline over time.

3.4 The import requirement associated with the above energy projections are also shown in Table 3.1. It is worth noting that import dependence on oil is expected to increase from 76 percent in 2010-11 to 80 percent by the end of the Twelfth Plan. Import dependence on natural gas is projected to increase from 19 percent in 2010-11 to 28.4 per cent in 2016-17. In the case of coal, it will increase from 19.8 per cent in 2010-11 to about 22.1 per cent in 2016-17.

3.5 If energy were plentifully available in global markets at affordable prices, large energy imports may not present serious problems, although even in those circumstances problems of energy security would remain. In fact of course, energy prices are rising globally and imports will be expensive. This underscores the need for moderating the growth of energy demand by achieving higher levels of energy efficiency while also increasing domestic supplies of energy as much as possible. Energy prices have a crucial role to play in achieving both objectives.

Table 3.1

Projected Primary commercial Energy Requirement

(Million tonnes of oil equivalent)

	2010-11*	2016-17@
Oil	164.32	204.80
Of which imports	125.5 (76.4%)	164.8 (80.5%)
Natural Gas & LNG	57.99	87.22
Of which imports	10.99 (19%)	24.8 (28.4%)
Coal	272.86	406.78
Of which imports	54 (19.8%)	90 (22.1%)
Lignite	9.52	14.00
Hydro	10.31	14.85
Of which imports	0.48 (4.6%)	0.52 (3.5%)
Nuclear	6.86	9.14
Renewables	0.95	1.29
Total Energy	**522.81**	**738.07**
Total Imports	**190.97**	**280.12**
% of Total Energy	**36.53**	**37.95**

Note: Provisional data; @ On the assumption that annual demand/growth would be 6.5 per cent. upto 2016-17. The figures include use of oil and gas feed stock for fertilizer and other non-energy usage*.

Energy Efficiency

3.6 Increased energy efficiency is the only way to contain energy demand without jeopardising growth and it must therefore receive high priority in the Twelfth Plan. Increasing energy efficiency requires action on two fronts: rationalising energy prices to incentivise energy efficiency and taking non-price initiatives to push the economy towards greater energy efficiency. The role of energy pricing is discussed in the next section.

3.7 There is considerable scope for non-price initiatives to promote energy efficiency. Several of these are included in the National Mission on Enhanced Energy Efficiency which was launched in 2008 as one of the eight missions in the National Action Plan for Climate Change. The measures include labelling of consumer durables for energy efficiency, imposing targets for reducing energy use in energy intensive industries, introducing energy efficiency in buildings, etc. These components of the Energy Efficiency Mission are listed in Box 3.1

Box 3.1

Promoting Energy Efficiency

The following are the main components of the Energy efficiency Mission. These programmes have resulted in avoided generation capacity of over 7,500 MW during the first four years of the Eleventh Plan.

- **Standards and Labelling of Equipment & Appliances:** Labelling has been introduced for 16 major energy-consuming appliances, providing users with information on the energy use of a model, and its relative efficiency of compared to others. It has been made mandatory for air-conditioners, refrigerators, distribution transformers, and tube lights.

- **Energy Efficiency in Buildings:** A national Energy Conservation Building Code (ECBC) has been prepared for the design of new commercial buildings. Over 700 ECBC-compliant buildings are at various stages of construction. Two States have adopted ECBC, making it mandatory for all new, large-commercial buildings to comply with the Code. Performance contracting through Energy Service Companies (ESCOs) is being promoted to enable the retrofit of existing buildings so as to reduce their energy consumption.

- **Energy Efficiency in Industry:** 467 industrial units from 8 sectors have been declared as Designated Consumers. Together they account for about 35 per cent of the total energy consumption in India. Each designated consumer has been prescribed a target percentage reduction in its specific energy consumption to be achieved by 2014-15. Those who exceed their targets would receive tradable Energy Saving Certificates for their excess savings, which could be used for compliance by other designated consumers, who find it expensive to meet their targets through their own actions. A major programme to enhance energy efficiency of small and medium enterprises is also being launched, focusing on SME clusters, and the development of local consultants, equipment vendors, and financial institutions through replicable pilot projects.

- **Residential Lighting:** The penetration of energy-efficient compact fluorescent lamps (CFLs) in the domestic sector has been relatively limited because of the high costs of CFLs. The Bachat Lamp Yojana (BLY) provides CFLs to households at the cost of incandescent bulbs. Distribution Companies select qualified investors to sell high quality CFLs in their region. The investors earn carbon credits due to the lower energy use by the CFLs. The BEE has registered a country-wide Programme of Activities (POA) under the Clean Development Mechanism (CDM) which enables the quick registration of each investor-led project as a CDM project under the POAs. Currently over 20 million CFLs have already been distributed under the BLY programme.

- **Energy Efficiency in Agricultural Pumping:** Replacement of inefficient agricultural pumps by efficient pumps is enabled through the performance contracting mode. Pumps on designated feeders (which have no other loads) are evaluated for their current energy consumption, and then the existing pumps are replaced with efficient pumps by an ESCO. The resultant energy savings are evaluated, and the ESCO is paid a share of the savings. 6 pilots have been launched to assess the viability of this model.

3.8 The use of super critical and ultra-super critical technologies in power generation can reduce the coal requirement of electricity production. Domestic capacities for building such power plants are being established. We should try to ensure that a much larger part of the capacities initiated in the Twelfth Plan will be of the super critical variety and we should prescribe that from the Thirteenth Plan onwards all new capacities must be super critical or ultra-super critical.

3.9 Shift in modes of transport from roads towards railways in the case of freights, greater use of public transport in cities, and use of inland water transport can also make a big difference to total energy use. The scope for affecting such a shift depends upon our ability to increase the competitiveness of the Railways as a freight carrier and also on urban transport policies which emphasise Rapid Mass Transport. These issues are discussed in Chapter IV.

3.10 New technologies like IGCC and energy efficient use of gas plants through facilitating distributed generation in CHP mode by developing network of gas pipe lines must be encouraged. Development in technology for Carbon Capture and Storage (CCS) need to be carefully monitored to assess the suitability and cost effectiveness of this technology for Indian conditions. A major effort must be made to expand energy from clean energy sources. The

share of new renewable energy in total commercial energy use at this juncture is around 10 per cent with conventional hydro-electricity accounting for another 22 per cent. The share of new and renewable energy could go up to 15 per cent by 2020. With improved capacity utilisation, this may result in a higher share of clean energy in the overall energy basket. The twin measures of energy efficiency, and larger share of clean energy, will help in reducing greenhouse gas emissions further.

3.11 An Expert Group on Low Carbon Strategies for Inclusive Growth, in its Interim Report, has estimated that emissions intensity of our GDP could go down by 23 to 33 per cent over 2005 levels by 2020, depending upon the intensity of the mitigation effort, while achieving the target 9 per cent GDP growth.

Energy Pricing

3.12 Energy prices have a key role to play both in promoting energy efficiency and in ensuring expansion of domestic supply. They promote energy efficiency by providing an economic incentive to shift to more energy efficient technologies, an objective that is helped by the various non-price actions discussed above. Rational energy prices are also necessary to ensure expanded energy supply because otherwise energy producers will not generate the investible surpluses needed to fund the costs of exploration and production. Unfortunately, the structure of energy prices at present is very different from what it should be.

3.13 An integrated energy policy was approved by Cabinet in 2009 under which fuels that are tradable (i.e., imported or exported) would be priced in line with global prices. This alignment has yet to be achieved.

Pricing of Petroleum Products

3.14 The position regarding petroleum products, where we are importing around 80 per cent of our requirement is that petrol prices are aligned with world prices (and indeed bear an extra burden of taxation) but diesel prices are at least 20 per cent lower than they should be if they are to be fully aligned. Kerosene prices are as much as are 70 per cent lower and LPG prices 50 per cent lower. This misalignment is not only imposing a burden on the exchequer and the oil companies, it also causing serious distortions. The massive under-pricing of kerosene is leading to large scale diversion for adulteration with diesel and petrol, generating a huge volume of black money. Only about half the kerosene distributed through the PDS actually reaches the consumer. The LPG subsidy is completely untargeted, and for the most part benefits people in the middle and upper income classes.

3.15 Natural gas pricing presents special problems since international pricing of natural gas is not as easily implemented as it is for oil. At present, natural gas from the KG basin and other domestic sources is priced at $4.2–5.7 per mmbtu whereas imported LNG ranges from $13-14 mmbtu. Part of the problem with discovering a domestic market price for natural gas is that the first priority for natural gas is fertiliser, where the final price being controlled, the cost of gas is simply passed on into a higher subsidy. This problem would not arise if the system of fertiliser subsidy is shifted to a fixed subsidy with market determine pricing.

Coal Prices

3.16 Coal prices are theoretically decontrolled, but in fact they are adjusted only in consultation with the Ministry. Indian coal has high mineral content and a lower calorific value as against imported coal, but even accounting for this difference, the price of domestic coal is 30 to 50 per cent lower than imported coal. The expected demand for coal from the power sector cannot be met except through a significant increase in imports, which poses two problems. First Indian power plants are not designed to take more than 10 to 15 percent of imported coal. Besides power produced are not willing to accept higher cost fuel because that puts them at a disadvantage compared with producer produces using domestic coal. It is essential to develop some mechanism of providing power producers with a mix of domestic and imported coal consistent with their technical constraints so that the higher cost of imported coal is averaged with the lower cost of domestic coal.

Electricity Prices

3.17 Electricity to the consumer is also under-priced. Electricity prices are set by State regulators but most regulators have shown a tendency to hold back tariff adjustments, typically under political pressure. At times, the discoms are also discouraged from seeking tariff revisions. The result is that electricity tariffs are lower than they should be for many categories of consumers over and above that of agriculture, which jeopardises the financial position of the discoms.

3.18 A transition to more rational energy pricing requires upward adjustment in all these prices. Since different Ministries are involved, a coordinated view is necessary based on a holistic understanding of the rationale of the move. The adjustment needed cannot be achieved in one go, but the process must begin so that a full adjustment occurs over two or three years. Increasing prices is never easy, but it is also true that our ability to grow rapidly in a world of high energy prices depends crucially on our ability adjust to these prices. Suppressing energy prices will not help. There is a case for insulating the poor from these price increases by a targeted subsidy but what we have at present is a much more general subsidy.

Oil & Gas Production

3.19 India is heavily dependent on imports for supplies of both oil and gas. As shown in Table 3.1, the import component of domestic oil consumption is about 77 per cent. (after adjusting for export of refined petroleum products) and in the case of natural gas, it is about 19 per cent. These percentages are projected to rise to 80 percent and 28 percent respectively by 2016-17. Exploration and production (E&P) activities in oil and natural gas therefore have to been given special emphasis.

3.20 Oil and gas exploration policies under NELP were designed to achieve rapid expansion of domestic production with the involvement of private investors. So far 235 blocks have been awarded. However, the results achieved thus far are disappointing. There has been some increase in crude oil production and a significant expansion of domestic gas output. However domestic production of both oil and gas needs to be significantly improved. ONGC's performance in increasing production, despite the allocation of a large number of blocks, has been disappointing. The international response to the recent NELP offers has been poor. It is necessary to re-examine whether the current policy provides a sufficiently attractive framework for policy which can attract investors in this area. There is need for a stable long-term regime of fiscal incentives which is comparable to what exists elsewhere. The issue of pricing of natural gas and its linkage with international prices also need to be clarified if investors are to be attracted to this sector.

3.21 Non-conventional gas resources, particularly shale gas and also coal bed methane (CBM), have dramatically changed the supply scenario in the US. Similar developments are taking place elsewhere. A major thrust needs to be given to the identification of shale gas resources in India and the determination of the feasibility of exploiting them, which depends on several technical factors. Expansion of CBM should also receive priority attention. An effort to map available Shale gas resources is currently underway and is expected to be completed by the end of 2011.

3.22 Expanded usage of natural gas will continue to be dependent on imported LNG, which is an expensive proposition at present. As against the domestic natural gas price of $4.5–5.7 mmbtu from K.G. Basin, prices of imported LNG are $13–14 mmbtu which is equivalent to $78–85 per barrel of oil. It is important that we develop strategies which will permit the expansion of gas usage, including LNG, so that the portfolio of hydrocarbons is more evenly spaced out. This should take into account the greater likelihood of gas discovery in India's economic zones, as well as the possibility of gas assets abroad including assured forms of contractual supply. The Twelfth Plan must therefore focus on further expansion of NELP, development of shale gas exploration, new coal bed methane blocks and expansion of gas pipeline network. A major focus will have to be on aligning oil and gas prices to market conditions. With oil prices expected to remain firm in global oil markets, this will be a major challenge to meet.

3.23 As part of the focus on clean fuel approach, ethanol blending of 5 per cent in petrol was initiated during Eleventh Plan and currently about 3–5 per cent of ethanol is blended in petrol. There is a need to expand the supply of bio-fuels, including bio-diesel, to reduce the dependence on imported oil. The share of bio-fuels, including bio-diesel and ethanol, needs to be increased during Twelfth Plan Considerations of energy security justify a policy of acquiring energy assets abroad. ONGC Videsh has already invested $11 billion in such assets. Similar investment should be undertaken in coal and also in uranium to have access to energy assets in other resource rich countries which would enable us to meet domestic demand.

Power

3.24 Power generation (utilities + captive) has grown at 5.8 per cent per annum during the period 1990-91 to 2010-11 and the implicit elasticity with respect to GDP is 0.87. This is much lower than 1.09 recorded in the period 1993-94 to 2003-04. It is estimated that, in order to sustain GDP growth at 9 per cent the demand for grid power will grow by 6 per cent per annum to 1,200 billion units (Bu) by the end of the Twelfth Plan. If diesel/FO based captive generation is to be curtailed, as it should be for energy efficiency, we have to plan for grid supply of at least 1,350 Bu.

Capacity Creation

3.25 The Eleventh Plan had targeted creation of 78.7 GW of additional capacity for grid power. Actual realization may not exceed 50 GW, largely on account of slippages in public sector projects. The shortfall in achieving the targets has been primarily due to poor project implementation, inadequate domestic manufacturing capacity, shortage of power equipment, and slow-down due to lack of fuel, particularly coal. More than 80,000 MW of new power capacity is already under construction. Hence it may be reasonable to target 1,00,000 MW of new power capacity during the next Plan. This will, however, need an effective resolution of issues holding up domestic production of coal and effective measures for improve financial health of power utilities. The Twelfth Plan should, therefore, aim at capacity creation of about 100 GW, which will include 28 GW of capacity from projects which were supposed to be completed in the Eleventh Plan, but are now expected to be completed in the first two years of the Twelfth Plan. We must ensure that not only the spill-over projects from the Eleventh Plan are completed at the earliest, but that slippages in the capacity addition programme for the Twelfth Plan are minimised. In addition, we should examine whether it is possible to back additional gas-based power capacity for initiation/completion during the Twelfth Plan, given the competing demand from the fertiliser sector.

3.25 The share of the private sector in capacity expansion has gone up substantially in the Eleventh Plan and it is expected that 33 per cent of the total incremental capacity will come from the private sector. In the Twelfth Plan this share is expected to increase further to about 50 per cent. Since most of the new power capacity will consist of thermal plants, it is essential to ensure that coal availability does not become a constraint. This is a serious problem as discussed below.

3.26 India has a substantial potential for creating hydro power capacity, especially in the North Eastern region. The pace of capacity creation in this area has been slow and it is vital that special emphasis be given to expedite environmental and other clearances, so that the pace of work on these hydro-electric power projects can be stepped up. Early completion of these projects will also generate an income stream for the North Eastern States which will enable them to accelerate the pace of development.

3.27 It is also necessary to take measures to increase the share of gas based power and also of nuclear power. Safeguards in respect of the latter will be further reviewed and additional measures taken as required. Both these are areas with great potential and will need investments.

Transmission

3.28 In order to support the large expansion in consumption and production of electricity, the transmission and distribution network will have to be significantly expanded and strengthened. Some private sector investments have been made in transmission in the Eleventh Plan and it is important to build a policy framework within which more private sector investments will be forthcoming in the Twelfth Plan. A special project on power evacuation from the North-East will have to be undertaken. The possibility of such lines passing through Bangladesh could be considered reflecting our mutually beneficial inter-dependence. Technological development for transmission lines of 765 KV and over 1,000/1,200 KV is of great relevance in order to reduce land requirement and also transmission losses.

Distribution

3.29 The distribution segment in the power sector is clearly the weakest link in the power system. The current losses of distribution utilities before accounting for State subsidy are approximately Rs. 70,000 crore. Continuation of losses on this scale is simply not viable. There are three elements that explain these large losses. First, State power regulators have, in most cases, lagged in setting power tariffs annually as they were supposed to. This is largely a reflection of political pressure on the regulators and in some cases also of political pressure on the utilities themselves to ensure that they do not ask for tariff revision. Second, the supply of free or virtually free power to the farm sector, and its mostly un-metered nature, is leading to considerable leakage. Finally, State-owned power utilities have tolerated large losses, often

reflecting collusion between the distribution staff and consumer. They have not made investments needed on the transmission side to reduce losses and have also not fully used the meters that have been installed under the meterization programme, to identify and rectify power leakage.

3.30 Since the financial viability of the power sector as a whole depends upon the revenues collected at the distribution end, it is absolutely vital that the distribution system is made financially viable during the Twelfth Plan. This can be done within the existing system of publicly owned distribution system by bringing in modern systems of management, use of IT, and enforcement of accountability. Another way is to go in for privatisation as some States have done. Delhi for example, has privatised the distribution segment with good results in the term of reduction in AT&C losses. Other states have resorted to "franchising" in which a private company takes over the management of the distribution system and collection of revenues on the basis of a predetermined revenue sharing model. Franchising has given good results in several areas, and the experiment is being replicated.

3.31 Since distribution is entirely in the domain of the States, action to improve distribution has to be taken by the State government. States should give this issue high priority. The Central Government can at best incentivise action in a manner which allows the States room for experimenting with all the different ways of obtaining better results.

3.32 With new capacities being set up in different States, it is essential that we move to operationalise the Open Access policy. Although the introduction of Open Access has been mandated in the Electricity Act, 2003, there has been reluctance in the States to give freedom to customers having requirement of 1 MVA and above to choose their own sources of supply. This should be expedited so that power markets are widened and deepened.

Rural Electrification

3.33 Access to power has been particularly poor in rural habitations and the Rajiv Gandhi Grameen Vidyutikaran Yojana RGGVY was devised to remedy this problem by providing connections to all villages and free connections to BPL families. There are, however, still a large number of habitations left uncovered and a very large population that has no connectivity. It is desirable to try and universalize access of power during the Twelfth Plan and this requires dealing with the large backlog in the States of Uttar Pradesh, Bihar, Orissa and Assam and some of the other North East States. However for effective universal access the RGGVY programme has to be restructured. Connectivity by itself is only part of the problem, since in many States there is also a real shortage of power. Besides RGGVY focuses only on household supply and does not address the need for providing electricity for agriculture, which needs three phase supply. This in turn requires strengthening of the rural network, and not just last mile connectivity to households, which is what RGGVY covers.

3.34 There are other schemes which provide electrical connectivity to people below poverty line. Solar lanterns have been distributed at subsidized rates. There is also an initiative for developing other resources of clean energy for both rural and urban consumption. These programmes need to be widened and strengthened.

Coal

3.35 The demand for coal has risen by about 8 per cent per annum during the Eleventh Plan and may rise by about the same magnitude during the Twelfth Plan. Coal output expanded at about 7 percent per year in the five-year period of 2004-05 to 2009-10, with especially strong growth in both 2008-09 and 2009-10. However, in 2010-11 coal production remained stagnant. Domestic coal production was originally targeted to reach 680 MTA in the Eleventh Plan. This was scaled down to 630 mt in the Mid Term Appraisal and it is now expected to be only 554 mt. Of the 208 captive coal blocks allotted with 49 billion tonnes of reserves and a production potential of 657 mt per annum, the estimated annual production by the end of the Eleventh Plan is only 37 mt.

3.36 Given the strong growth in thermal generation projected in the Twelfth Plan, the aggregate demand for coal at the end of the Twelfth Plan is likely to be between 900 and 1,000 million tonnes depending upon the pace of implementation of power capacity. As against the projected demand of 900–1,000 million metric tonnes (mt) by the end of the Twelfth Plan, the domestic output is unlikely to exceed 750 mt leaving more than 200 mt shortfall to be met from imports. Even this assumes that domestic output will be able to increase by over 200 mt from current levels.

Fuel Supply Agreements

3.37 Uncertainties in coal supply are already affecting the establishment of generating capacity. Coal India is not entering into Fuel Supply Arrangements for more than 50 percent of the requirement of thermal plants, and that too only for 5 years. Private sector investors in power generation are unlikely to be able to access financing from banks if there is uncertainty about coal supplies. Although coal is importable, coal imports are much more expensive and power producers are reluctant to accept a fuel supply arrangement based on imported coal which would put them at a disadvantage. If domestic coal prices were aligned with world prices this problem would not arise. However, such a large adjustment may not be easy to achieve in a short period. CIL should explore the possibility of developing a mechanism to enable power producers procure a mix of domestic and imported coal consistent with their technical constraints.

3.38 To introduce a system of pooling domestic and imported coal prices for power producers so that the price they are charged does not depend upon whether they receive domestic or imported coal.

Environment Constraints

3.39 An important reason for low production in domestic production of coal is the inadequate incentive with the States to increase coal production. In addition, there have been, in the recent years, constraints due to tighter environmental regulations, problems in Resettlement & Rehabilitation (R&R), and also problems in land acquisition. The Ministry of Environment & Forests had adopted a policy of 'Go – No Go' in which coal mining was completely banned in No Go areas. However, as large coal bearing areas were suddenly declared No Go' areas, this would have severely limited the ability to expand domestic production of coal. Further, Comprehensive Environmental Pollution Index (CEPI) norms were introduced which prohibited mining in areas with a high pollution index, even if the pollution was due to other industrial sources. Coal being 'location specific', there is clearly a need to review this approach. A Group of Ministers is working on resolution of these issues and it is essential that an appropriate balance be struck between the need to protect the environment and the need for energy security.

3.40 Underground coal mining has the potential of greatly reducing the disturbance caused to the environment. However, current output levels from underground mining at 60 mt are very low and these mines are mostly old. There has been very little fresh investment in underground mining. It may be necessary to sharply increase the scope and share of underground coal mining and this will involve much greater mechanization and investment by private players.

Washeries

3.41 The quality of Indian coal is poor and needs to be improved through coal washeries which call for an expansion in washery capacity which would improve the quality of the coal and efficiency of the consuming industries. There has been a very marginal increase in the coal washery capacities. One reason for this is that the system of coal pricing does not contain a sufficient premium for higher quality coal. Coal India must move towards a pricing mechanism in which coal of higher calorific value is priced with an appropriate premium. It is also necessary to promote productive use of the large volume of washery rejects which contain large quantities of sensible heat.

3.42 Prospecting of coal in new areas must be energetically undertaken. It is planned that the exploration of all known coal bearing areas be completed during the Twelfth Plan. This will result in expansion of the inferred/proven category and thereby the overall availability.

Environmental concerns regarding these, particularly limitations in undertaking this work effectively in forest areas, will be addressed.

Coal Imports

3.43 With the best effort at increasing domestic production it will not be possible to meet the increased demand for coal from domestic production. Coal imports are expected rise from about 90 million tonnes at present to over 200 million tonne from 2016-17. The necessary infrastructure including ports and railways to service these projected import volumes will have to be in place.

3.44 Given the importance of expanding supply and the indifferent performance of Coal India in increasing production, there is need for inducting private sector investment in coal. It is already allowed for captive mining. There is no reason why it should not be opened up generally. In this context there is a case for reconsidering the merit of nationalisation of the industry.

Renewable Energy

3.45 Continued emphasis has to be placed on other renewable resources, especially on expanding wind power generation and in the emerging area of solar thermal and solar photovoltaic. While a National Solar Mission plans for a capacity of 22,000 MW by 2022, C-WET estimated a technically feasible wind potential of 49,000 MW. A fresh assessment of wind power a potential by some agencies has mentioned a higher figure which needs realistic review by the MNRE based on the scientific norms. These areas will need further study. The potential for such generation is clearly higher than current estimates of about 50 GW. Appropriate measures must be devised to strengthen a policy framework to use this.

3.46 It is also necessary that scientific and technological developments, especially in the solar energy field, are sufficiently internalised to keep the country abreast of international developments. In order to make solar power a success in the coming decades, it is vital that we develop the necessary domestic S&T capacity such that we can collaborate as peers with the rest of the global community.

3.47 A basic problem with most renewable energy sources is that they are significantly more expensive than conventional power. However, technological developments are reducing the cost of renewable generation and it is widely predicted that by 2019 the cost of solar electricity generation, which is currently six times higher than coal based electricity will come down to be approximately equal to the latter. However, this equalization is expected to occur partly because the cost of conventional fuels is expected to rise significantly. In other words, technological developments in the field of renewable energy will help overcome energy constraints, but only at significantly higher energy prices. This underscores the fact that in the

medium term, energy prices in India must rise to correspond more closely with world energy prices.

3.48 The overview of energy related issues presented in this chapter shows that a workable energy strategy for the Twelfth Plan requires a large number of actions by different Ministries in the Central Government plus action by State Governments in several areas. The success of the Twelfth Plan depends critically on our being able to ensure that all or most of these actions are taken within a reasonable period of time. Unless this can be done, energy constraints will limit the ability of the economy to reach 9 percent growth.

4

Transport

4.1 Rapid growth needs to be supported by an efficient, reliable and safe transport system. This is especially important for an economy concerned about competitiveness. On the basis of past experience in India, and the experience in other large economies, requirements of transport services are likely to grow significantly faster than overall GDP growth. Railway freight traffic elasticity is computed to be around 1.3. Civil aviation has grown by nearly 20 per cent per annum in the Eleventh Plan. Road traffic volumes, as measured by the consumption of automotive fuel, have grown by about the same rate as overall GDP. The expansion of urban centres has triggered an enormous demand for dependable urban mass transit and several cities are seeking to emulate the experience of Delhi by building a city Metro. International trade volumes have been growing faster than GDP and will continue to do so indicating the need to build adequate capacity in the ports. Further, appropriate linkages between ports, railway and road network need to be completed.

4.2 To meet these expanding demands large investments will be needed in roads, railways, ports and civil aviation sectors for augmentation of capacities and modernization. The public sector is expected to continue to play an important role in building transport infrastructure. However, the resources needed are much larger than the public sector can provide and public investment will therefore have to be supplemented by private sector investments, in Public-Private Partnership (PPP) mode. This strategy was followed in the Eleventh Plan and has begun to show results in both the Centre and the State sectors.

4.3 Institutional and organizational changes in some of the apex agencies involved in laying out the transportation network are also necessary. The process of corporatization of ports, restructuring of NHAI and the setting up the National Expressway Authority, form part of this process. Organizational and institutional changes have to accompany large scale investments that are needed in the railways.

4.4 A high level National Transport Development Policy Committee has been set up to develop a transport policy going up to 2030 which will facilitate the efficient expansion of the transportation network in a manner that would help to minimize energy use. It would also

place special attention to competitive pricing and coordination between alternative modes of transport. The resultant integrated policy framework is expected to provide the backdrop for the development of transportation in the Twelfth Plan.

Roads

4.5 India has the second largest road network in the world totalling 4.2 million kms but most of it is of poor quality. Half the network is not paved and the National Highways account for only 2 per cent of the total length. A start was made at giving a push to investment in roads in the Eleventh Plan. The NHDP-I (Golden Quadrilateral) and NHDP-II (North-South East West links) were started before the Eleventh Plan, but were effectively built in the Eleventh Plan. Small portions remain to be completed and these will be completed in the Twelfth Plan. The more heavily trafficked part of this network has to be strengthened through conversion to six-lane roads.

4.6 This programme, called NHDP-VI has commenced and will be progressively expanded. In order to ensure the inter-connectivity of districts, work in various phases of NHDP-III, IV, V will be progressively expanded. In addition, a new programme for construction of roads in the North East was begun in the Eleventh Plan, including the proposed Trans-Arunachal Highway. Completion of this network in the North East, along with road connectivity to Myanmar and Bangladesh will help open up the North East to mutually beneficial economic cooperation with Southeast Asia.

4.7 A master plan for 18,637 kilometres of expressways, with new alignments for both passenger and freight movements in high traffic density corridors based on “access control toll” needs to be taken up. These roads will be either 4 or 6 lane. The proposed National Expressway Authority of India is expected to take the initiatives for both land acquisition and to get the work executed under BOT mode.

4.8 Taking a longer term view the scope for expanding the National Highway beyond the present 2 percent of the total network needs to be carefully considered. The Twelfth Plan should set a reasonable target for what the National Highway component of the total network should be over the next twenty years and then workout a phased programme of expanding the National Highways to achieve the objective. The expansion should be on the basis of well-defined criteria giving due weight to network capacity needs and also the need to reach underserved areas.

4.9 In addition to the development of the National Highway network it will be essential to develop State Highways and District roads to ensure full connectivity. States must recognise that good quality roads are crucial for the competitiveness of investment in the state and the

Twelfth Plan for each state should contain an effective five year plan for the state and lower level roar networks part of a longer term twenty years plan for network development. The resources needed for road development will have to be mobilised by the Centre and the States for their respective spheres. As noted earlier, the Public Private Partnership (PPP) model has been extensively used in the road sector in both the Centre and the States and it will remain an important instrument in the Twelfth Plan. Rural roads are known to be a very effective catalyst for economic transformation. Studies conducted by Planning Commission and elsewhere have shown that the PMGSY roads have resulted in significant benefits to rural households because of better connectivity to markets and also easier access to health and educational facilities All rural habitations with a population of more than 1,000 in plain and 500-1,000 in hill and tribal areas are expected to be covered by March, 2012 under PMGSY. Even after a decade, a large number of villages and habitations in rural areas remain unconnected with good quality roads. It is necessary that universalisation of rural connectivity be completed during the next Plan. It can be taken up in phases with completion of on-going connectivity programmes for villages with population between 500 to 1000 and then expanding it to smaller villages and habitations. Specifically, in hilly areas, Left Wing Extremist affected areas and other sparsely populated tribal areas, habitations with population up to 100 would need to be connected. A major thrust is required in this area. This will further spread the benefits of PMGSY and promote inclusiveness. Lack of maintenance of roads is a major problem in India. Provision for maintenance of the National Highways comes from the non-Plan budget and typically only one third the required amount has been provided. The introduction of toll roads on a BOT basis has helped ensure maintenance in these roads. However, the rest of the National Road Network needs maintenance and this should not suffer for want of funds. Maintenance of PMGSY is taken care of under contractual agreement. The contractors are required to maintain the roads for 5 years after completion. However, subsequently, the State Governments are expected to provide funding. The involvement of panchayats and other PRI agencies to ensure the maintenance of roads may be a desirable initiative. These and other alternative mechanisms will be explored to strengthen maintenance arrangements for the road network.

Railways

4.10 Railways are very important part of any transport network especially for freight movement. They are much more energy efficient then road transport, with a much smaller carbon footprint. Indian Railways are one of the largest railways network in the world carrying 22 million passengers every day and carrying 923 million tonnes of freight a year. However, the quality of service provided leaves scope for substantial improvement in many areas. The average speed of trains is much lower than in other comparable countries. Railway safety is also an issue. The entire system is in urgent need of modernisation and this should have top priority in the Twelfth Plan.

The railway network has to be significantly augmented to increase its freight carrying capacity. The Rolling stock must be modernised and new, higher capacity locomotives inducted. Average speeds must be significantly increased. Special attention must be paid to augmenting carrying capacity of the trunk routes which account for only 16 per cent of the network, but carry 50 per cent of the traffic. An important component of Railways modernisation has to be extensive development of safety measures. Necessary investments for this will be stepped up during the Plan.

Box-4.1

Public Private Partnerships (PPP) in Infrastructure

Public Private Partnerships (PPPs) are increasingly becoming the preferred mode for construction and operation of infrastructure projects, both in developed and developing countries. PPPs are expected to augment resource availability as well as improve efficiency of infrastructure service delivery. Time and cost overrun in construction of PPP projects are also expected to be lower compared to traditional public procurement.

The adoption of standardized documents such as model concession agreements and bidding documents for award of PPP projects have streamlined and accelerated decision-making by agencies in a manner that is fair, transparent and competitive. This approach has contributed significantly to the recent strides in rolling out a large number of PPP projects in different sectors. India has 1,017 PPP projects accounting for an investment of Rs. 486,603 crore. According to the Private Participation in Infrastructure database of the World Bank, India is second only to China in terms of number of PPP projects and in terms of investments, it is second to Brazil.

Transport is the dominant PPP sector in India both by number of projects and investments, mainly due to the large number of road sector projects. Further efforts are needed to mainstream PPPs in several areas such as power transmission and distribution, water supply and sewerage and railways where there is significant resource shortfall and also a need for efficient delivery of services. Similar efforts would also need to be initiated in social sectors, especially health and education.

The Government has also been emphasizing the need to explore the scope for PPPs in the development of the social sectors like health and education.

Some of the major PPP projects undertaken thus far are: Delhi, Mumbai, Hyderabad and Bengaluru airports; 4 ultra-mega power projects at Sasan (Madhya Pradesh), Mundra (Gujarat), Krishnapatnam (Andhra Pradesh) and Tilaiya (Jharkhand); container terminals at Mumbai, Chennai and Tuticorin ports; 15 concessions for operation of container trains; Jhajjar power transmission project in Haryana and 298national and state highway projects.

4.11 The development of the Western and Eastern dedicated freight corridors are iconic projects which will greatly upgrade the capacity of the system. The completion of these projects must be undertaken in a time bound manner and carefully monitored to avoid delay. Aside from these, further expansion of the railway network is called for, not only along its existing alignments, but also for developing access to areas hitherto not being served by the railways, such as tribal areas, LWE districts and some of the hill regions where it is possible to build such networks.

While the Dedicated Freight Corridor will take care of the freight requirements, there is a need to have Dedicated Passenger Corridors to ensure effective and faster passenger services and modernise passenger movement system.

4.12 Railway modernisation will require a substantial increase in investments and in this context the financial performance of the system becomes crucial. Over the past few years there has been a steady deterioration of financial parameters. The current revenue model of Railways is clearly unsustainable. It leaves a very small surplus for investment and modernisation. There is a need to have a relook at the fare structure. In view of the rising costs of inputs, a domestic fuel adjustment surcharge, which automatically adjusts the fares in accordance with the changing costs of the inputs, would be a good model to work on. The operating rates, which should be between 80–85 per cent is now close to 95 per cent. An urgent reversal of this trend is essential. There is a need for adjustment and rationalisation of tariffs. Indian rail tariffs are highly skewed with much lower rates per passenger kilometre and higher rates for freight. This generates excessive demand for passenger lines and also discourages freight movement by rail. The Planning Commission has on several occasions recommended the establishment of an independent Tariff Regulation Commission for the Railways to fix tariffs in order to depoliticise the Tariff setting process. This is essential if the Railway system is to be put on a financially viable basis.

4.13 While improved financial performance will help it is unlikely to be able to generate the massive resources needed for railway modernisation. However, the quantum of private investment in the railways and railway related activities has the potential of being considerably expanded. Private container train operators have already commenced operations and are competing with Concor. It is important to ensure that they are given a level playing field with Concor so that private investment in this important area is expanded. Other possible areas for private investment include setting up of multi-modal logistic parks, development of manufacturing units for locomotives also and railway lines connecting the rail network to privately developed ocean ports. New areas also need to be explored.

Ocean Ports

4.14 The capacity of our ocean ports to deal effectively with growing international trade volumes has increased in the Eleventh Plan in part on account of private investment in the so-called minor ports, as well as in container terminals, dry-bulk and liquid handling facilities in the major ports. As a result, both berthing times and turn-around times have fallen. However, ports will meet only 50 per cent of the Eleventh Plan target. It is imperative that the pace of expansion of the port sector is accelerated, building on the successful experience of the past few years and increased co-operation between the publicly owned ports and private container and other terminal operators, as well as the strengthening of established private ports.

4.15 The draught in most of our ports is not adequate for dealing with bigger ships, the use of which is an important component of reducing costs. Deepening of selected ports and also intermediate off-loading terminals offer solutions that should be carried forward in the course of the Twelfth Plan. The pace of dredging has been inadequate and needs to be greatly expanded.

4.16 The capacity for dredging of ports in the private sector needs to be further augmented and full operational flexibility given to the ports to use it. While capital dredging of ports will lead to further deepening and larger size ships will be able to use the port, maintenance dredging will ensure a continued efficient operation of current port capacity.

4.17 Another constraint that has emerged is the lack of capacity/availability of rail and road networks linking ports especially the new minor ports coming up in the private sector. These connectivity projects should be identified on a priority basis and implemented using private participation wherever possible. In such cases the projects will need to be facilitated including in the matter of land acquisition.

Inland Waterways

4.18 The Inland waterways provide a clean and efficient mechanism for transportation of goods across regions where quite often road movement may not be feasible or in any case more expensive. Investments need to be promoted in this sector to develop it, particularly in the North Eastern Region and in a number of other major rivers. There is also a need to bring about legislative changes to make the creation of new waterways faster after technical assessment is made.

Civil Aviation

4.19 The Eleventh Plan saw extensive modernisation of the airport infrastructure through a combination of public and private investment. Chennai and Kolkata airports are being modernised by the public sector along with 35 non-metro airports. The two major metro airports – Delhi and Mumbai – have been successfully modernized in the PPP mode. The new Mumbai airport is also expected to be bid out for development by the private sector. In addition, the Hyderabad, Bangalore and Cochin airport offer good examples of the success of the PPP mode. There is scope for utilizing this model to further upgrade other airports.

4.20 The expansion of the airport network has increased the basis for air connectivity enormously. Air connectivity is vitally important for bringing mid-sized towns into the business network, thereby enabling wider distribution of manufacturing and commercial service provisioning across the country. There are large requirements of this connectivity in North-East and Left Wing Extremism affected Districts. In addition to the mid-sized airports modernized by AAI, further expansion of the airport network should be pursued in the Twelfth Plan to meet these needs.

4.21 In order to include a large number of potential towns for air-connectivity "daylight landing strips" offer one solution which is cost effective insofar as it does not require expensive night landing equipment. This can help us bring many more mid-sized towns into the air-connectivity network and facilitate the transactions of industrial and commercial business across the country.

4.22 Special efforts are needed for the modernization of navigation control with an aim to bring greater precision and enhancement of safety of passengers and cargo as well as greater efficiency in the air traffic control. The Gagan project has been launched by the Airport Authority of India in collaboration with ISRO. It envisages global navigation satellite system which would include better ground surveillance capability for surface movement control and guidance especially useful in poor visibility conditions and is likely to be operationalized by June, 2013. The implementation of this programme is presently continuing at various airports.

4.23 The hiving off of the Air Traffic Control from AAI has been under consideration to bring more focused approach with a view to enhance the equipment upgradation and manpower deployment in the area of air traffic control. It is appropriate that a separate entity is formed early for this purpose.

5

Sustainable Management of Natural Resources

5.1 As the economy gains the capacity to grow rapidly, it will come up against the constraint of limitations of natural resources and the need to exploit these in a sustainable manner. Sustainability has traditionally been viewed in terms of limiting the damage that economic activity imposes on the environment and remedying this damage as much as possible. In addition to these traditional environmental concerns, we need to pay attention to the challenge posed by the need to manage our water resources in a manner which enables the finite water resources to meet the growing demands of rapid growth and also the need to manage finite land resources to the same end.

Water Resources Management

5.2 Water is a relatively scarce resource in India since we have 16 per cent of the world's population and only 4 per cent of the usable fresh water. Since the annual availability of fresh water is fixed and demands are bound to expand as production increases, larger production can only be sustained if available water resources are harnessed in a sustainable manner and water use efficiency is increased. At the same time, India receives nearly 1,200 millimetres of rainfall through the year. Even the most arid meteorological division namely, West Rajasthan, receives nearly 300 millimetres of rainfall. The relatively arid parts of the country receive annual rainfall in excess of 650 millimetres, while most of the country gets over 800 millimetres of annual precipitation. It is necessary to match our use, through improvement in efficiency, with the annual replenishable water supply that the country receives. Available evidence suggests that we are resorting to increased use of water, mostly on an unsustainable basis, pushing the country towards a grave water crisis. Irrigation accounts for 80 per cent of our total water usage, and 60 per cent of irrigation water and 80 per cent of rural drinking water comes from ground water.

5.3 Satellite data reveals that there has been a decline in the ground water level of 4 centimetres each year between 2002 and 2008 in the alluvial tracks of Northern India, where natural rates of recharge are high. This is equivalent to an increase in over 70 per cent in the rate of water extraction compared to the previous decade. The decline in water table is also evident in the crystalline, volcanic and mountainous regions that account for nearly 70 per cent of our landmass where natural rates of ground water recharge are very low.

5.4 Lack of any coordination between competing uses and the complete absence of regulation has aggravated the problem inherent in the anarchic drilling for ground water. The fact that neither power nor water is adequately priced has only promoted the misuse of our ground water resources.

5.5 Over the last several years, many rural habitations have been provided drinking water supply. However, the number of "slipped back" habitations has increased every year because the same aquifer is also being tapped for irrigation and the left hand of drinking water does not know what the right hand of irrigation is doing. This has also led to wetlands and rivers drying up due to reduction in base flows which had historically sustained them. The lowering of water tables has also caused, in many cases, contamination with arsenic, fluoride and other harmful substances.

5.6 Water quality issues also arise due to chemical pollution through excessive fertiliser use and reckless dumping of untreated waste into our rivers. Only about 30 per cent of the total sewage generated in the country is actually treated before being dumped into available water bodies.

Maintenance of Surface Water Bodies

5.7 We have over a million water bodies comprising of lakes, reservoirs and tanks. Their storage capacity has been eroded by poor maintenance and siltation, as well as other forms of degradation, including invasion of alien water flora. Concerted efforts are needed to engage in the process of de-siltation and restitution of these water bodies, through treatment of their catchment areas so that they can play the fruitful purpose of providing capacity to store rainwater, provide water for drinking and other purposes and lend themselves to fisheries.

Ground Water Management

5.8 Ground water will continue to be a major resource for both irrigation and drinking purposes. It is vital to ensure that this resource is used in a sustainable manner. For this, we must, greatly expand the scope of rainwater harvesting and ground water recharge. Preliminary studies suggest that the extent of recharge that is possible with the existing precipitation is extremely high in the alluvial plains where the rates of recharge are high. In the more rocky areas of Central India, where recharge rates are lower, rainwater harvesting and ground water

recharge needs to be supplemented by the creation of rain-fed small-sized reservoir/water bodies, including farm ponds and dug wells to impound rainwater. This needs to be done by converging the MGNREGA with the Integrated Watershed Management Programme.

Aquifer Mapping

5.9 Since groundwater is the main source of water in India, special emphasis is needed on obtaining an accurate picture of groundwater resources, including a comprehensive mapping of our aquifers at a watershed scale, with their storage and transmission characteristics. Our current network of around 60,000 observation wells is completely inadequate given the explosive rise in groundwater use in recent years through nearly 30 million groundwater structures. During the Twelfth Plan we need to move from a ratio of 1: 500 at present towards a ratio of at least 1:100 between observation wells and groundwater use structures so that we gain a more accurate idea of actual groundwater use.

Stakeholder Aquifer Management

5.10 Based on the aquifer mapping exercise, we need to develop sustainable groundwater management plans for each aquifer. This requires action on the ground involving partnerships of stakeholders at the village-level with hydro-geologists and social mobilizers, who would guide collective sharing and sequential use of groundwater based on a careful understanding of the storage and transmission characteristics of different aquifers in each of the hydro-geological settings outlined in the MTA of the XIth Plan. Promising work on a reasonable scale has started in this direction in Andhra Pradesh. The Andhra Pradesh Farmer Managed Groundwater Systems (APFAMGS) project is supported by the Food and Agriculture Organization and implemented by NGOs in seven drought-prone districts of Andhra Pradesh. The project employs participatory hydrogeological monitoring, by engaging farmers in data collection and analysis, and building their understanding of the dynamics and status of groundwater in local aquifers. This is complemented with crop water budgeting, whereby the quantity of water required for crops is assessed at the aquifer level and compared with the amount of groundwater actually available to arrive at a suitable cropping pattern that would permit sustainable groundwater use. The total outreach of the program is estimated at 1 million farmers. Such initiatives need to be undertaken at many more locations in the Twelfth Plan.

Reforms in Major and Medium Irrigation

5.11 Although large investments have been made in major and medium irrigation, including through AIBP, irrigated area served by canals has not increased significantly in the past decade. A large number of major as well as medium projects are continuing for 30–40 years without completion whereas the normal gestation period is 15 to 20 years for major projects and 5-10

years for medium projects. There was a spill-over of 553 projects into the XIth Plan from previous Plan periods and more than half of these were started by State governments without the approval of the Planning Commission and hence are not eligible for Central assistance. Several have run into inter-state disputes. This reflects the chaotic state of affairs in the development of irrigation schemes across the country.

5.12 The utilization of irrigation potential created has also been poor and the gap between potential created (IPC) and potential utilized (IPU) has been increasing steadily over time. One reason for this is that irrigation potential is calculated on the basis that the volume of water expected in the reservoir divided by a presumed depth of irrigation required for a presumed cropping pattern. However, the total water available is often less than assumed, possibly due to faulty project design, faster than projected siltation, poor maintenance of distribution channels and other weaknesses in both implementation and institutions. There is also a widespread tendency for those near the headworks to appropriate much larger amount of water shifting to water-intensive crops leaving less water for tail-enders. All these developments are encouraged by lack of co-ordination across agencies and departments, and the inadequate or complete absence of involvement of water users through Water User Associations (WUAs).

5.13 What is heartening to note, is that where, as in Gujarat and Andhra Pradesh for example, WUAs have been adequately empowered and provided autonomy, they have demonstrated a great sense of ownership and the results have been positive The Government of Andhra Pradesh reports that in 2008/09, WUAs collected Rs. 474 crore against the demand of Rs. 150 crore for operation & maintenance, which wiped off the overdues of the last five years and led to a 15 per cent improvement in water use efficiency. Space-based observation over command area management can be used to provide the information inputs needed to better manage water utilisation in the command area. In the Twelfth Plan we must try to maximise the use of information inputs, particularly space-based imagery, to resolve these categories of problems.

5.14 A major problem with most irrigation systems is the erosion of the financial capacity of the State Governments to channel resources to complete and maintain projects. The water charges are very low and the collection is inefficient. As a result, the revenues from water charges which are meant to cover the entire operating charges do not cover even 12 per cent of the operating expenses. This understandably compromises the ability of the concerned departments to take effective steps to maintain the system which in turn leads to water use efficiency of the present level of 30–40 per cent. While it may be argued that some of the "lost" water from the canal system recharges ground water levels, the manner in which it does and where it does is not necessarily advantageous. Further in several parts of the country this has led to water logging and salinity, especially in arid regions.

5.15 It is of the utmost importance that the Command Area Development Programme (CADP) is fully integrated with the AIBP and the two must proceed on a common timeline. Considerable changes are also required in the staffing pattern of the irrigation departments to include people from a wider profile including social mobilizers who can bridge the gap with the users.

Pricing and Regulatory Changes for Ground Water

5.16 There is a great need for significant changes in the way we price both water and electric power required to pump up groundwater. It may not be possible to levy a charge on the use of ground water for agriculture but the power used for pumping ground water can and should be economically priced. At the very least, State governments should levy a cess on all power for agricultural use earmarking the cess to fund ground water recharge programmes in the same aquifer.

5.17 Another step that helps improve both the power situation and revive groundwater is the separation of agricultural feeders, which enables villages to get 24 X 7 three-phased power for domestic uses, schools, hospitals and village industries while farm pump-sets, which require much more power, obtain eight hours or more of quality power on a pre-announced schedule. The programme of feeder separation has to be carried through across the country. Gujarat has achieved very good results by combining feeder separation with an extensive watershed programme for groundwater recharge. Punjab, Karnataka, Andhra Pradesh, Maharashtra and Madhya Pradesh have also moved forward in this direction. Feeder separation needs to be extended to all States, especially where groundwater is extensively used.

5.18 There is an urgent need to come out with a clear legal framework governing the use of ground water. Presently, there is a conflict between common law that is seen to govern the use of ground water and the public trust doctrine enunciated by the Supreme Court. A new ground water law is required that is in consonance with the public trust doctrine and which can enable restrictions on the mining of ground water. There is also a need for an overarching Water Framework Law that would give teeth to the *New National Water Policy*. It is also necessary to create regulatory bodies in different States to resolve conflicts across different kinds of uses of water and between users. The Centre should formulate and facilitate the adoption by States of a model Water Resources Regulatory Authority Bill.

5.19 There is also a need to set up a National Water Commission (NWC) that would monitor compliance with the national water strategy. The reports of the NWC would be an invaluable guide to investment clearances provided by the Planning Commission and environmental clearances provided by the Ministry of Environment and Forests. Currently there is no mechanism to monitor compliance with conditionalities laid down while providing clearances, which otherwise remain somewhat toothless and only on paper. They get reduced to

conditionalities without consequences. The NWC needs to be set up after due consultation with the States.

Water Requirements of Industry and Urban Centres

5.20 Use of water by industry and urban areas needs to be made much more efficient. This requires reducing dependence on fresh water, especially groundwater (which is increasingly being over-exploited across the country) and ensuring safe disposal of waste. A major hike is required in investments in water recycling or waste-water treatment, which would simultaneously help reduce dependence on fresh water and make a positive impact on water quality. In the long-term such an investment would pay for itself and would be more cost-effective than the current practice of extracting groundwater or transporting water over long distances. It would also, of course, help reduce the cost otherwise borne by society because of polluting industries. Water and environmental issues are also critical to sustained and high quality urbanization. A key element of this has to be planning for safe disposal of waste. It is estimated that about 80 per cent of the water used by urban households is disposed of as waste and 70 percent of this waste is untreated and ends up polluting either our groundwater or our rivers, which are the sources of fresh water. Reform of the urban water sector must follow good international practice, which involves reducing dependence on fresh water and relying much more on treatment and recycling of waste-water, which also reduces pollution. Countries like Singapore have reduced their dependence on fresh water and even a sector which needs high-quality water like the semiconductor industry uses recycled water. Today our installed capacity to treat waste is less than 20 per cent of what we need. The investments we are making in cleaning rivers have no chance of yielding results unless we have better plans in place for safe disposal of waste, which continues to pollute our rivers.

5.21 Most Indian cities today spend anywhere between 50–70 per cent of their water supply finances on electricity to pump water. As the distance increases, the cost of building and then maintaining the water pipeline and its distribution network as increases. If the network is not maintained then water losses also increase. Today, municipalities officially report anywhere between 30–50 per cent of the water supplied as 'lost' in leakages. It would be far more efficient to revive traditional and local water bodies, which also help recharge groundwater.

5.22 The National River Conservation Plan (NRCP) was launched in 1995 to check pollution levels in identified polluted stretches of major rivers. At present NRCP covers 35 stretches of polluted rivers in 164 towns across 20 States. But the sewage treatment plant (STP) capacity in the Ganga basin is only 31 per cent of the domestic sewage generation. In Class I and II towns along the main stem of the Ganga River, the corresponding figure is 35 per cent. Thus, a gap of around 65 per cent exists between domestic sewage generation and STP capacity resulting in untreated sewage flowing into rivers and other water bodies. As a result, in many locations

along the Ganga, the BOD/COD has worsened. The ultimate goal should be to provide sewerage facilities for all and zero discharge of untreated sewage into our rivers.

5.23 Attention should also be given to low cost ways of treating waste water. Technologies based on biotic processes exist which can substantially reduce the level of pollution in water bodies based on different strains of microbes. These technologies are new and perhaps not entirely validated for different situations. However, given the need for purification of water in the years ahead, it is desirable to develop cost effective and low cost ways of solving this problem.

Land

5.24 Rapid growth is only possible if some land which is currently used for agricultural purposes, or if preferably degraded forest land can be made available for building much needed infrastructure, establishing new industrial units, undertaking mining and accommodating the inevitable expansion of urban settlements. The questions that arise are how is the land that is needed for these activities to be obtained, how are the existing owners of the land or those dependent on it for their livelihood to be compensated and how are the nation's interests in preserving food security to be protected? The past two decades have seen all those issues became highly contentious.

5.25 These problems have arisen in large part because the legal framework under which land has been acquired is outdated. It is based on the principle of "eminent domain" under which the State can forcibly acquire land for a public purpose at prices which do not reflect the market price nor provide any premium to reflect the fact that the acquisition is forcible. Where the acquisition is of forest land, which is not owned by tribals but on which the tribals have traditional usufructuary rights, the tribal communities have not been consulted as is required under PESA and the displacement of tribal population has not been accompanied by well planned resettlement and rehabilitation programmes. Independent estimates place the number of people displaced following development projects over the last sixty years at 60 million, and only a third of these are estimated to have been resettled in a planned manner. Most of these people are the asset-less rural poor, marginal farmers, poor fisher-folk and quarry workers. Around 40 per cent of those displaced belonged to Adivasis and 20 per cent to Dalits. Given that 90 per cent of our coal, more than 50 per cent of most minerals and most prospective dam sites are in Adivasi regions, there is likely to be continuing contention over issues of land acquisition in these areas, inhabited by some of our most deprived people.

5.26 The way forward is to move away from the colonial perspective of treating people as "subjects", which is inherent in the doctrine of eminent domain, towards a vision of citizens,

whose rights are guaranteed under the Constitution. Ultimately, we have to go beyond narrow legality to seek broader legitimacy. Recognising that all the land needed for development cannot be obtained in a purely voluntary manner, there is need for a fair land acquisition law which resorts to compulsory acquisition only where it is unavoidable and provides fair competition, and also ensures that Resettlement and Rehabilitation of dislocated persons is built into the legislation. R&R provisions must be made mandatory and not reduced to what they have become, conditionalities without consequences. It also requires an unequivocal commitment to imaginatively exploring ways of rebuilding the livelihoods of those adversely affected by development projects.

5.27 The country also needs a land management strategy to address three issues:

- Which land should be used for which purpose?
- How should land be acquired for the new purpose (industry/urban)?
- What form and quantum of compensation and rehabilitation should be provided to those whose lands are acquired?

Food Security

5.28 The issue of food security is perhaps the easiest one to resolve. It is true that over the past decade there has been a decline in net sown area of approximately 2 million hectares. However it must be kept in mind that this is only 0.6 per cent of the total net sown area. Given that agricultural productivity is currently half of what it is in many other countries, the solution for food productivity lies not in stopping diversion of agriculture land in all circumstances, but in increasing food production through higher land productivity. Industrialisation, urbanisation and development generally will require a diversion of land to new uses. Efforts can and should be made to avoid diversion of highly productive agricultural land, but even this cannot be a rigid criterion to be applied in all cases. In the interests of food security, we may place reasonable restrictions on acquisition of multi-crop irrigated land, without making it impossible, for example, to acquire land for security purposes or construction of highways or railway lines etc. In districts where the net sown area is less than 50 per cent of total geographical area (the national average), it may be necessary to set a cap on sown area to be acquired, but this should be done in a manner that does not make land acquisition impossible when it is in the larger public interest.

Proposed Land Acquisition and Rehabilitation & Resettlement Bill, 2011

5.29 Government is currently working on a combined Land Acquisition and Rehabilitation & Resettlement Bill, 2011. The reason for combining the two into a single legislation is that land acquisition and resettlement & rehabilitation (R&R) need to be seen necessarily as two sides of the same coin. R&R must always, in each instance, necessarily follow upon significant

acquisition of land. Not combining the two within one law, risks neglect of R&R which has been the experience thus far.

5.30 The draft Bill, which has been made public for comments, has to balance the need for facilitating land acquisition for various public purposes, including infrastructure development, industrialisation and urbanisation, while at the same time meaningfully addressing the concerns of farmers and those whose livelihoods are dependent on the land being acquired. The method of fixing the price at which land will be acquired needs to be carefully studied to ensure that it is fair to those whose land is acquired while also not being unrealistically high. The R&R package includes provision for families whose livelihood is primarily dependent on the land being acquired, even if they do not own property.

5.31 The definition of public purpose for land acquisition should include strategic purposes, such as armed forces and national security; infrastructure and industry, where benefits largely accrue to the general public; land acquired for R&R purposes; village or urban sites for residential purpose for the poor or educational and health schemes; land for private companies for public purpose properly defined and also land needs arising from natural calamities.

Land Use Strategies

5.32 Since the total supply of land is limited, land must be used most efficiently for whatever purpose it is allocated. Therefore, what lands are to be used for industry and urban growth, and how industry and urban conglomerations use those lands, are essential issues too in a national land management strategy.

5.33 To rationalise the process of choosing land for industrialisation, State Governments should aim at developing land clusters for industry, taking into account the needs of specific industries so that industries that are synergistic can come up in one cluster with appropriate infrastructure (like auto, pharmaceutical, leather, textile clusters). Other factors like availability of water, environmental issues, extent of population displacement need also be taken into account while identifying land for industrial clusters. It is necessary to formulate guidelines for industrial land productivity for various types of industries based on global benchmarks and this should determine the extent of land use by the industry.

5.34 However three specific issues that relate to land use for urban requirements need urgent attention of policy-makers and planners. First, India is using its urban land very inefficiently for urban needs because it is not permitting sufficient substitution of capital for land in line with international practice. This is the result of very low FAR and FSI permitted in India (less than 4 in India compared with 10 in the rest of the world). There is a lingering bias in India against vertical cities and a preference for horizontal spread. Horizontal cities use more

land than vertical cities. Moreover urban utilities such as water and sewerage as well as public transport can be more efficiently provided in vertical cities.

5.35 Second, land use planning for urban development must be done by considering larger areas together so that transport, sewerage, and various facilities required for a good community, viz. schools, hospitals, shopping, and recreation facilities can be suitably provided for. The plot-by-plot method of permission to build and develop results in 'good building complexes' within 'bad cities' with inadequate public infrastructure, as is happening in the peri-urban areas around the country's major cities.

5.36 Third, urban land when it is scarce, as it will be with urban growth, acquires great value. At the same time, with urban growth, the state and local urban bodies are hard pressed to provide the urban infrastructure required. Therefore strategic management of the land assets in and around urban areas is essential for ensuring that governments will have the financial capacities required to provide infrastructure and public services.

Managing the Environment

5.37 The statutory and regulatory framework for managing the environment and dealing with related issues to protect the environment was established in India well before most other parts of the developing world. The effectiveness and adequacy of this framework needs to be critically examined. As we achieve the objectives of environmental protection, energy security, requirements of expanding industry, urban centres and transportation also need to be realised. It is self-evident that there will be trade-offs and these require careful balancing and a proactive search for solutions and additional financial allocation for the sector.

5.38 In order to achieve any given objective, one needs information, a framework for action and execution. This applies to environment to an even greater extent than to other areas. It is vital that we preserve and improve water, air and soil quality and at the same time our capacity to monitor, design and make focused intervention. In this task, new space-based technologies are an integral component. Today, we have the resources including satellite imagery, Global Positioning System (GPS), Geographic Information System (GIS) and computational and analytical systems at hand to undertake these tasks. This must be a focus area in the Twelfth Plan so that appropriate compilation of diverse information can permit us to have incisive analysis and, therefore, enable the system to make effective intervention, execution and monitoring.

5.39 Several issues have been flagged during the Planning Commission consultations with different stake holders which deal with land, mining, forest and wildlife management, climate change, waste management, reduction of pollution, conservation of forests and biodiversity etc. These must be viewed in the light of the enormous inter-connections that exist within the broader dynamics of environmental management.

5.40 Issues that require focused attention during the Twelfth plan are:

- Securing ecology of watershed and catchments,
- Cumulative Environmental Impact Assessments (CEIAs) for vulnerable regions
- Carrying capacity studies in selected river-basins
- Maintaining acceptable water quality and quantity through pollution control of water resources
- Restoration of wet lands/lakes and
- Management of waste water discharge from industrial and commercial establishments into major water bodies is necessary.

5.41 Activities to strengthen in-situ conservation and sustainable use of biodiversity to enhance livelihood security, Promotion and valuation of biodiversity and ecosystem services in the national planning process including study of the economics of ecosystems and biodiversity (TEEB) are essential. Prevention of ocean dumping, discharge of untreated coastal industrial effluents and traffic in marine resources including corals and fishes, treatment, storage & disposal facilities (TSDF) for hazardous waste management and its possible utilization as supplementary source of energy and raw material needs to be considered. Systems for effective collection of wastes and reprocessing and channelling e–waste from the informal sector to the formal sector to ensure recycling in an environmentally sound manner are necessary.

Improving Forest Cover

5.42 This must include both canopy cover improvement (intensification) and extension of afforestation of degraded forest land (extension). To meet the country's demand for timber and non-timber forest produces, we need to pursue a comprehensive approach encompassing horizontal as well as vertical use of space and adequate financial support. This is particularly true in the Himalayan region and in the parts of Central India and Western Ghats that have significant forest areas and also difficult terrain. Many of these areas, especially the Himalayan region, are sparsely populated and have heavy forest cover and fragile soil quality. The relevant State Governments, in most cases, have limited fiscal resources to conserve these forests and treat the watersheds in order to manage soil erosion. The benefits from the preservation of these forests accrue to the nation at large. There are, however, costs for undertaking such activities, including forest protection, and these costs are largely borne by the concerned State Governments. There is validity in the argument that a special scheme needs to be devised for

Central assistance to the States for this purpose on a clear-cut and very well defined basis. Forestry extension can be achieved through afforestation of non-conventional forest areas adopting farm and agro-forestry approaches. While doing so fruit bearing spaces may be given importance for the strengthening nutritional security of the rural population.

5.43 Development of mining in number of areas would lead to reduction in forest cover. The current policy for regeneration of forests needs to be reviewed. The forest cover needs to be monitored for a period of ten years after mining is over and full technical support provided to the State Forest Corporations and other organisations to undertake responsibility for nurturing the forests. Our policies must aim at regeneration of the lost cover after the natural mineral resources have been extracted.

Preserving Wetlands

5.44 Wetlands are important for the sustenance of underground aquifers and also for the preservation of biodiversity. Inland lakes and ponds in forest areas directly feed into groundwater recharge, besides improving water availability to flora and fauna in the forests. The extent of such water bodies should be actively extended during the Twelfth Plan. Water flows (quantity) and water quality needs to be monitored on a pre-defined design both for surface water, as well as for sub-surface water. The information that will arise from such monitoring can be used, within an appropriate framework, to enable better management of our water resources.

Treatment of Municipal Solid Waste and Urban Sewage

5.45 Facilities for the treatment of municipal solid waste & urban sewage and, where possible, recycling of treated water, must be an integral part of urban development planning. Municipal Solid Waste (MSW) utilization, either for production of manure, generation of energy, or as landfill, must be carried out in a way that is effective in terms of MSW removal and environmentally acceptable. Continuous improvement in ambient air quality must be achieved through regulatory control over emissions, increasing awareness about civic liability, using state-of-the-art technology and global best practices so as to achieve the standard set by the National Ambient Air Quality, by the end of the Twelfth Plan. Policy intervention should facilitate industrial symbiosis with respect to environmental pollution based on the principle ‘polluter must pay’.

Mining

5.46 Mining for coal and other ores is always disruptive. We must ensure the rectification and restoration of mined areas and ensure that some of the revenue/costs of the mining go towards direct restoration and also towards the strengthening of environmental resources and ecosystem resilience in adjoining areas. Where possible, it may be advisable to encourage underground mining as against strip mining (open cast), technological improvement and perhaps create different regulatory costs in favour of underground mining where feasible.

Community Involvement in Forest Management

5.47 Community involvement in forest management is necessarily location-specific. In Central India, this may take certain forms involving rights to minor forest produce and certain kinds of co-operation between community agencies and the Forest Department. In the Himalayan region the experience has been different, where in some areas *van panchayats* has been a successful experiment. Given the wide variation in the resource position, as well as in the culture and also the terrain of the forest areas, the emphasis must be on carrying forward programmes that are locally rooted, collaborative and that which seemed to have worked well in the past.

Biodiversity, Marine Environment and Wildlife

5.48 India is recognized as a mega bio-diverse country and has four identified bio-hotspots. They are, the Himalaya hotspot which has diverse eco systems ranging from alluvial grasslands, subtropical broadleaf forests to alpine meadows. It is home to important populations of a wide range of fauna. The second hotspot in India is in the North East of India and part of the Indo-Burma hotspot comprising an aggregate of 2 million $km^{2.}$ It has a wide diversity in flora and fauna. The third hotspot is in the rain forests of the Western Ghats and is home to a rich endemic assemblage of plants, reptiles and amphibians. Finally, the Andaman & Nicobar island chain forms the biological hotspot in India that is closely allied to the Sundaland hotspot of South East Asia.

5.49 Both habitation pressures and invasive alien species constitute a threat to native bio-diversity in both terrestrial and aquatic eco systems. Fragmentation and degradation of wildlife habitats adversely affects the population of wild animal species resulting in increased man-animal conflicts. The tiger, lion, elephant and other endangered species need protection.

5.50 The country has taken a pioneering step in formulation of a Biodiversity Act, 2002 and Biodiversity Rules, 2004 assigning adequate importance of community conservation and management of bio-resources for the benefit of all stakeholders. This Act is very much in tune

with the International convention and Protocol on Biodiversity Conservation. Proper implementation of the Act at the *Gram Sabha* level will be the important task for the Twelfth Five Year Plan.

Community Rights & Minor Forest Produce

5.51 While it is clear that what the primary tribal collectors of NTFPs get today is a very small fraction of the potential value embedded in NTFPs, we must also ensure that apparent movement forward on PESA does not end up making things worse for the primary tribal collectors of NTFPs.

5.52 Mere notification of MSPs will not do. There is good reason to believe that MSP will not be effective for the tens of thousands of poor gatherers living in remote villages, each with a small volume of produce for trade. This is so because trade in NTFPs is neither competitive nor transparent, particularly viewed from the gatherers' perspective. The reach of a typical procurement agency is limited and it is only in the tendu trade that some states have reached gatherers, at high transaction costs. Even in tendu trade, intermediary aggregator-contractors exhibit rent-seeking behaviour. State procurement agencies are more likely to make MSP effective for small trader-aggregators rather than for the numerous scattered gatherers.

5.53 There are four reasons for this:

- Lower transaction costs
- The trader/aggregator will sort and grade the produce (the MSP will be set for a product of specific quality grade, which is an important requirement because of the wide range of quality attributes exhibited by each produce)
- Relationship of dominance/dependence between gatherers and trader/ aggregators and
- Rent-seeking opportunities for field staff in dealing with traders.

5.54 Now if an MSP is declared, but remains effective only for trader/aggregators, it can have a negative impact on gatherers because:

- It will be a handicap for legal trade with gatherers, which will have to pay MSP, even while most traders/aggregators get away with paying less,
- It will provide a floor price for traders/aggregators, de-risking their trade and improving their competitive strength. This increases the bargaining power of trader/aggregators vis-à-vis gatherers

5.55 What is needed instead is a powerful business model which ensures that collectors of NTFPs become shareholders in an institution that helps them to climb up the value chain and retain more value through professional sorting, grading, processing, packaging, branding and positioning. Such an institution would need to be committed to protecting Adivasi interests and must operate with great autonomy on strict business principles. Indeed, we may need to

visualise several such institutions, each of which would be centred round those NTFPs that share a similar market structure as also geographical spread. These institutions must have the requisite capacity to absorb inevitable losses in initial years when they will have to take risks and counter entrenched trading interests with competitive action. They also need public spirited governing boards which understand NTFP markets, set medium-term goals in terms of commercial returns and long-term goals in terms of market transformation, leading to sustainable social and environmental results. And nimble-footed operational systems which are competitive and enable flexible response to evolving market challenges. The establishment of these public institutions should be accompanied by simultaneous formation of gatherers' collectives which will aggregate produce and enable progressive distribution of income among gatherers.

Climate Change

5.56 The scientific consensus holds that unless Carbon Dioxide (CO_2) and other Greenhouse Gas (GHG) emissions for the world as a whole are significantly reduced, there will be an unacceptable rise in temperature, changes in rainfall pattern, sea level rise, etc., all of which will have adverse consequences for large parts of the world. India is one of the countries that will be adversely affected.

5.57 A comprehensive response to the challenge can only come from an agreed international strategy with an appropriate distribution of the burden for mitigation between industrialised and developing countries, recognising that historically the industrialised countries have contributed most to the accumulation of GHG in the atmosphere. These issues are being discussed in the UN Convention on Climate Change. Whatever be the outcome of the international negotiations, we must have a national strategy for mitigation and adaptation of our own.

5.58 The Prime Minister's Advisory Council on Climate Change has outlined a National Action Plan for Climate Change (NAPCC). The Action Plan was released by the Prime Minister in June 2008 and consists of eight Missions that are listed in Box 5.1:

Box 5.1

National Action Plan for Climate Change

- **National Solar Mission** seeks to deploy 20,000 MW of solar electricity capacity in the country by 2020. The first phase (2010-12) is currently underway during which 1,000 MW are planned to be installed.
- **National Mission for Enhanced Energy Efficiency** creates new institutional mechanisms to enable the development and strengthening of energy efficiency markets. Various programmes have been initiated, including the Perform, Achieve and Trade (PAT) mechanism to promote efficiency in large industries, and the Super-Efficient Equipment Programme (SEEP) to accelerate the introduction of deployment of super-efficient appliances.
- **National Mission on Sustainable Habitat** promotes the introduction of sustainable transport, energy-efficient buildings, and sustainable waste management in cities.
- **National Water Mission** promotes the integrated management of water resources and increase water use efficiency by 20 per cent.
- **National Mission for Sustaining the Himalayan Ecosystem** establishes an observational and monitoring network for the Himalayan environment so as to assess climate impacts on the Himalayan glacier and promote community-based management of these ecosystems
- **National Mission for a "Green India"** seeks to afforest an additional 10 million hectare of forest lands, waste lands and community lands.
- **National Mission for Sustainable Agriculture** focuses on enhancing productivity and resilience of agriculture so as to reduce vulnerability to extremes of weather, long dry spells, flooding, and variable moisture availability.
- **National Mission on Strategic Knowledge for Climate Change** identifies challenges arising from climate change, promotes the development and diffusion of knowledge on responses to these challenges in the areas of health, demography, migration and livelihood of coastal communities.

5.59 Government of India has also set up an **Expert Group on Low Carbon Strategies for Inclusive Growth,** which is inter-sectoral and based in the Planning Commission. The Expert Group submitted its interim report in May, 2011. The final report of the Expert Group will be submitted in time for the Twelfth Plan. The Expert Group has emphasized action on the following main fronts:

(i) *Power:* In the power sector, Expert Group has suggested action both on supply and demand side. On the Supply side, we need to adopt super-critical technologies in coal based thermal power generation as quickly as possible. Gas being in limited supply; its best use is not in base load power, but in combined heat and power systems in large establishments. We need to invest in renewable technologies, particularly solar, wind and second generation bio-fuels. Development of hydro-power, in a sustainable manner, is

critical to maximising renewables which pose additional load curve problems on the supply side. On the Demand side, we need to accelerate adoption of super-efficient electrical appliances through a combination of market and regulatory mechanisms. We also need to enhance efficiency of agricultural pump-sets and industrial equipment using power by facilitating adoption of best available technology.

Last but not the least, we need to modernize our transmission and distribution systems to bring our technical and commercial losses down to the world average levels, while at the same time universalizing access to electricity for the poor. This would not only require acceleration of power reforms, but also adoption of new and frontier technologies like the smart grids.

(ii) *Transport*: On the transport front, we need to increase the share of rail in overall freight transport. This is not possible unless we drastically improve the efficiency of rail freight transport, and also make it price competitive by bringing down the levels of cross-subsidisation between freight and passenger transport. Completion of dedicated rail corridor must be taken up on top priority. We need to improve both share and efficiency of our public transport system; and also further need to improve the fuel efficiency of our vehicles through both market based and regulatory mechanisms.

(iii) *Industry:* The Expert Group has identified major sources of industrial emissions and made specific recommendation for sectors like Iron & Steel and Cement, which account for over 60 per cent of industrial process emissions. It is important that green-field plants in these sectors can adopt best available technology; while existing plants, particularly, small and medium ones, modernize and adopt green technology at an accelerated phase. For this to happen, financing mechanisms will need to be tied up in an equitable and transparent manner.

(iv) *Buildings:* While efficient appliances can reduce demand for power to some extent, change in the design and structure of building itself can act as a multiplier in reducing overall energy demand. India is fortunate that most of our commercial buildings that will be extant in 2030, are yet to be built. We need both evolve and institutionalize Green Building Codes at all levels of Government: Centre, State and Urban Local Bodies.

(v) *Forestry:* Up to the Eleventh Plan our focus was on increasing the area under forest and tree cover. Given the scarce land availability and the trade-offs involved, achievement in this front has been limited. However, there is a tremendous scope for increasing the stock and quality of existing forests. “Green India Mission” is being designed to regenerate at least 4 million hectares of degraded forest; increase density of cover on 2 million hectares of moderately dense forest; and overall, increase the density of forest and tree cover on 10 million hectares of forest lands, waste lands and community lands.

5.60 The Expert Group's Final Report is likely to contain greater details of technology, policy and finance options that are necessary to pursue a low emission, inclusive growth trajectory in the future. Some of these will be built into the growth strategy for the Twelfth Five Year Plan.

5.61 Finally, there is the broader issue of adapting agricultural practices to serious alterations in climatic conditions, and to manage our water resources in a more comprehensive and efficient fashion. There is an urgent need for developing agro-climatic zone specific water harvesting and management technology to enable rural communities to withstand the effects of climate change. Similarly, genetic improvement of agricultural crops to develop a flexible portfolio of plant varieties that can thrive in drier or wetter environments, flash floods, pest attacks due to increase and decrease in humidity, etc. is an important area of research that needs to be pursued in the Twelfth Plan.

5.62 In brief, all levels of Government need to act together to combat the challenge of Climate Change. The State Governments need to develop a State Action Plan for Climate Change that can be dovetailed to the National Action Plan for Climate Change, by identifying vulnerable areas and communities, and by developing a State specific action programme for the above mentioned areas that will facilitate mitigation and adaptation action against the challenge of climate change. Some State have already made a beginning; other States need to take similar action during the Twelfth Plan period.

6

Rural Transformation

6.1 The Census of 2011 estimates that 833 million people continue to live in rural India. A very large proportion of them are either wholly or significantly dependant on their livelihoods on farm activity – be it crop agriculture, horticulture, animal husbandry or fisheries. The expansion of income opportunities in the farm sector and a progressive absorption into non-agricultural activity is the most potent weapon for reducing poverty. Expansion of non-farm income opportunity in rural areas also has enormous potential and a great deal of this is related to farm activity – such as post-harvest operations, maintenance of farm equipment etc. There is therefore a virtuous cycle inter-connecting the expansion of farm economic activity and that of rural non-farm income opportunities.

6.2 The development and transformation of the rural economy requires rapid expansion of employment and income opportunities, both on farm and off farm. Growth in employment and income opportunities in the farm sector is discussed in Chapter 7. This chapter mainly deals with the development programmes that are supporting rural transformation process by improving rural infrastructure and supporting rural livelihoods. Rural transformation also requires improvements in health, education and skill development. These are dealt with in detail in separate chapters.

Improving Rural Infrastructure

6.3 The Eleventh Plan saw an unprecedented injection of resources from the Union Budget to the rural and farm sector. This thrust forms the substance of the *Bharat Nirman Programme* and the Mahatma Gandhi National Employment Guarantee Act has provided a major foundational support. Over the past five years it has provided nearly 9,000 million person days of work at a total expenditure of more than Rs 110,000 crore. MGNREGA has been highly inclusive, as is evident from the fact that the share of SC/ST families amongst beneficiaries has ranged between 51–56 per cent and 41–50 per cent of workers have been women. It has also promoted financial inclusion since over 100 million bank/post office accounts have been opened for the poorest segments of our population who comprise of the MNREGA workforce.

6.4 The coverage of rural settlements under the National Rural Drinking Water Programme has shown an impressive rise, with almost universal coverage being reported. Dramatic improvement has also been evident in sanitation. The coverage of rural households provided with individual latrines has improved sharply from 27 per cent in 2004 to 62 per cent presently.

6.5 The *Indira Awas Yojana* (IAY) programme has provided houses to 22.5 million BPL households, while more than 3.5 million SHGs have been formed under the SGSY. The coverage under the National Social Assistance Programme which provided a pension for the BPL population over 65 had increased to 21.6 million beneficiaries by 2009/10. The age of eligibility having been lowered to 60, the number of beneficiaries will expand significantly in the Twelfth Plan.

6.6 These are impressive achievements but there is also no doubt that they can only contribute at the margin and the bulk of the income improvement for this section of the population must come from a substantial improvement in land productivity and the rising incomes that would provide even for landless labour. It is also true that the performance of these programmes can be greatly improved. Several reforms have to be carried out in how we implement these schemes, including design improvement and incorporation of greater flexibility.

6.7 In all these programmes there is a case for a certain proportion of funds to be set aside for a "flexi-fund" to promote innovation that could subsequently be mainstreamed into the programme. There is also need for greater State-specific flexibility reflecting the variations in conditions across the country. These reforms could make a major contribution to improvement in rural infrastructure which has a direct bearing on farm growth.

6.8 The following seven major flagship programmes are operating in rural areas. (1) Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) (2) National Rural Livelihood Mission (NFRLM) (3) *Indira Awas Yojana* (IAY) (4) National Rural Drinking Water Programme (NRDWP) and Total Sanitation Campaign (TSP) (5) Integrated Watershed Development Programme (IWDP) (6) *Pradhan Mantri Grameen Sadak Yojana* (PMGSY) (7) Rural electrification, including separation of agricultural feeders and *Rajiv Gandhi Grameen Vidyutikaran Yojana* (RGGVY). Of these, PMGSY has been discussed in the chapter on transportation and RGGVY in the chapter on energy. This chapter covers the remaining five programmes.

MGNREGA

6.9 Experience thus far suggests that while MGNREGA is generating employment, the technical soundness of design and quality of works undertaken in MGNREGA falls short of what

is needed to ensure land productivity enhancement. There appear to be two critical areas in regard of MGNREGA that need to be addressed and resolved in the Twelfth Plan.

6.10 First, the technical capacity at the local level has to be significantly enhanced. This is in regard to planning, design and quality of works, as well as of their maintenance. Planning for MGNREGA on a mini-watershed and aquifer basis would improve outcomes. To strengthen the demand-driven character of the scheme and guarantee legal entitlements it is important to record applications for work. There is a clear case for establishing a pool of local "barefoot" engineers/technical assistants who could be trained up through an appropriate mechanism, enabling them to fulfil the need for technical and managerial capacity in MGNREGA, as well as in other rural infrastructure projects

6.11 Second, it is important that the selection of works reflects the needs, aspirations and priorities of the local people, without which the community will not necessarily have a sense of ownership of the project. The latter is a vital component of the concept of rural infrastructure creation. The training of a pool of local youth in technical skills must also incorporate their ability to act as social mobilizers and ensure the involvement of PRI representatives at every level of the process. They would be guided in this process by a dedicated team of technical professionals to be created at each cluster of around 30 villages that broadly correspond to the boundaries of a mini-watershed and aquifer. Madhya Pradesh and Maharashtra have already initiated work in this direction.

6.12 Delays in wage payments have emerged as the most frequently heard complaint under MGNREGA. At times payments have not been made even after nine months and workers are rarely being paid compensation for the delay. The major reason for delay is that measurements of work are not being made on time, mainly due to lack of adequate technical staff at the block level. There are also bottlenecks in the flow of funds through the system, at times because data on the Management Information System (MIS) is not being filled up in time. Better use of information technology, as in Andhra Pradesh, is worth emulating. The tightly integrated, end-to-end computer network in Andhra Pradesh identifies delay in execution of any work registered online and takes corrective action immediately. Free availability of payment information facilitates public scrutiny and transparency.

6.13 There is a need to involve NGOs who could support *gram panchayats* in planning, implementing and conducting of social audits of MGNREGA works. There are good examples of such successful models across the country. There is a need to disseminate the learnings from these experiences in the field and improve the functioning of the programme.

6.14 Rural India has a large population of artisan families, many of whom are from the minority and tribal communities. Most of these artisan farmers do not own any land and many find themselves in a difficult condition with poor access to market linkages and to remunerative

livelihoods. Thought must be given as to how the MGNREGA in conjunction with the N RLM programme can help these artisan communities to obtain a decent living while at the same time conserving the base of craftsmanship, which is India's cultural heritage.

National Rural Livelihoods Mission (NRLM)

6.15 The experience with MGNREGA has clearly highlighted the problems that are often encountered when a programme is universalised without sufficient preparatory work and support systems being in place. This has been a problem with the SGSY scheme also. While the fast growth of the SHG-Bank Linkage (SBL) model is heartening, there are also many concerns. A large part of the problem derives from the top-down, target-driven approach that has undermined the demand-driven thrust, which was the original mandate. There are also reports of high rates of mortality in many SHGs, which has had an adverse impact on the credibility of the SBL model in the eyes of key stakeholders, including potential women members, as also bankers.

6.16 The real power of the SBL model lies in the economies of scale created by Self Help Group (SHG) Federations (comprising 150−200 SHGs each). This is evident, for example, in bulk purchase of inputs (seeds, fertilisers etc.) and marketing of outputs (crops, vegetables, milk, NTFPs etc). They can also provide larger loans for housing and health facilities to their members by tying up with large service or loan providers. A variety of insurance services can also be made available, including life, health, livestock and weather insurance. It has also been shown how doing business with SHG Federations can help public sector bank branches in remote rural areas become viable entities.

6.17 Taking a cue from the lessons of the SGSY experience, the Government of India has launched the National Rural Livelihoods Mission in 2011. There is a clear understanding that the SBL programme can only be successful if it is tied up with livelihood programmes such as improved agriculture, dairying, marketing etc. Thus, the SBL and livelihood programmes are complementary to each other and their simultaneous implementation is the key to poverty alleviation. Incomes raised through livelihood initiatives need to be saved. Of these savings, women are the best custodians. These savings must, in turn, be reinvested in livelihood options that raise incomes, setting up a virtuous cycle. The distinctive focus of the NRLM is on Federations of SHGs that become powerful units of economic empowerment, enabling the poor to radically alter the balance of power in the markets they participate in as both producers and consumers.

Indira Awaas Yojana (IAY)

6.18 A major weakness of the *Indira Awaas Yojana* (IAY) has been the quality of housing. There have been complaints about weak foundations, poor roofing materials and incomplete constructions. There is a clear need for developing and popularising innovative, location-specific technologies, materials, designs and methods through a network of institutions, which could result in low-cost, environment friendly and disaster resistant houses as per local cultural preferences. Better systems for monitoring of the programme are also required.

6.19 Part of the problem is linked to the available assistance under the IAY programme. This has been recently enhanced but it is widely felt that this enhancement may be inadequate. It is necessary to examine whether increasing the permissible loan amount even if at a slightly higher interest rate could solve the problem. This could be best achieved through the NRLM route by making it a loan product offered by SHGs. Finally, to transform IAY into a larger habitat development programme, we need to ensure domestic water, sanitation, clean fuel and electricity with housing. This calls for deeper convergence across various flagship programmes.

Sanitation and Drinking Water

6.20 Questions of sustainability have somewhat undermined the otherwise dramatic success in the Total Sanitation Campaign (TSC). The *Nirmal Gram Puraskars* (NGPs) spurred competition among PRIs to hasten toilet construction, but it does not appear to have ensured sustained use. A 2008 study covering 162 NGP *Gram Panchayats* in six States shows that only 4 per cent of GPs were genuinely open defecation free. In 32 per cent of the GPs, more than 40 per cent of the people are not using the toilets built for them under TSC.

6.21 The problem arises because TSC is becoming increasingly state-led and target-driven and often implemented without any conscious effort to create required awareness at the community level. The programme is often driven by a desire to achieve fund utilisation and not as an exercise organically linked to awareness creation and demand generation processes. Top-down IEC strategies of posters and brochures with no individual contact have proven to be ineffective. Great effort is required to sustain the gains of the adoption phase to ensure that slip-backs do not occur. A phased approach needs to be developed for achieving universalization with quality, based on a process truly driven by demand from a community that is committed to improved sanitation.

6.22 One of the limitations of the TSC is the narrow range of technology options offered in a country with such immensely diverse geographic, hydrologic, climatic and socio-economic conditions (high water table, flood prone, rocky ground, desert/water scarce areas and extreme

low temperatures). This has led to many problems, including non-acceptance by local communities, water pollution especially in shallow water table regions, and waste of public funds.

6.23 It is also clear that use of toilets cannot be sustained without provision of water supply and many NGP villages have slipped back because the promised water supply never materialized. Equally, safe drinking water cannot be ensured without quality sanitation in place. Sanitation and drinking water programmes have to be converged at all levels of implementation. Since rural drinking water is overwhelmingly supplied by groundwater, there is an urgent need to adopt an aquifer management perspective so that the demands of irrigation do not lead to a drying up of drinking water sources.

6.24 The separation of feeders supplying power to tube-wells from other rural feeders ensures that villages can get full day three-phase power for domestic uses, schools, hospitals and village industries while farmers get around 8 hours of full-voltage three-phase power according to a pre-announced schedule. Predictable, reliable, high-quality, even if rationed in amount is better than the earlier erratic, poor quality supply that incentivized both power theft and extensive mining of groundwater since pumps were left on to benefit from electricity when it became available .

6.25 Drinking water supply schemes have also suffered from poor upkeep. Responsibility for operation and maintenance of water supply schemes lies with the PRIs but in many states this responsibility is poorly defined and not supported by transfer of adequate funds and trained manpower to the PRIs. PRIs and Village Water and Sanitation Committees (VWSCs) are not willing to take over completed schemes in which they were not involved at the planning and implementation stages. Inadequate water resource investigation, improper design, poor construction, substandard materials and workmanship and lack of preventive maintenance also lead to rapid deterioration of water supply schemes.

Integrated Watershed Management Programme (IWMP)

6.26 The XIth Plan proposed ground breaking initiatives under the IWMP. But progress on these has been less than satisfactory. Much of the higher allocations have been absorbed by the backlog of older incomplete projects. The new projects have also been slow in incorporating the innovative elements in the new Common Guidelines. Four functional areas, namely (a) institutional development, (b) capacity building (c) monitoring and evaluation and (d) livelihood orientation need to be an integral part of the programme from the very beginning. Each of these is quality and process-oriented activities, which demand a whole series of initiatives and partnerships to be put into place. These will require much great attention in the Twelfth Plan.

6.27 Institutional building needs the involvement of local people and social mobilisation has, therefore, to be an important component of the programme. Master Trainer Organisations that are specially dedicated to this task have to be developed on an urgent basis. Likewise, empanelment of credible institutions from academia and the voluntary sector for monitoring, evaluation and social audit is necessary to infuse the programme with accountability and quality. Finally, the distinguishing characteristic of the new IWMP approach is its emphasis on livelihoods, especially for asset-less families. There are many government and non-government organisations in India who have done pioneering work in this regard and the Department of Land Resources (DoLR) will need to facilitate partnerships of each state government with carefully selected institutions to carry this process forward with momentum.

6.28 National Rainfed Areas Authority (NRAA) could play a major anchoring role in infusing the IWMP programme with quality. For this it needs to be greatly strengthened through inclusion of experts in social mobilisation, institution building, rural management, rural livelihoods and rural technology and people with experience in implementing watershed programmes. Civil society representatives could also form part of the governance structure of NRAA to provide a perspective, expertise and experience from the grass-roots. The NRAA also needs to be provided as much professional autonomy as possible in its functioning.

Health, Education, Capacity Building & Technical Skills

Health and Nutrition

6.29 Issues of health and nutrition in rural areas are extremely important for the wellbeing of the population. This issue is dealt with in detail in Chapter 9. Efforts in the following activities need to be greatly strengthened and they should be seen to form an intrinsic component of rural development.

- Vaccination of all children
- Access to safe drinking water and acceptable sanitation standards
- Widespread testing and provision of nutritional supplements for vulnerable sections, particularly adolescent girls, young mothers and children
- Strengthening the rural health infrastructure, especially Sub-Centres, PHCs and CHS, which includes adequate staffing and ready availability (preferably 24x7) and better mobile linkages (emergency services) to the hospital network.

School Education

6.30 As in the case of health, likewise for education and skill development inputs into the rural areas that must include:

- Extending and improving the quality of the primary school network, as well as scaling up of secondary schools, operating on a hub and spoke arrangement, so that all villages can have adequate access.
- Improving the quality of education that is imparted, which has to entail active supervision of the qualification of the teachers and the quality of education
- Testing and training the teachers must be a priority area

Skill Development and Building Capabilities

6.31 It is advisable to draw from the population, segments that are likely to remain in the village for provision of upgraded technical training. This is the only way to localize technical skills in the village and make it self-sustained.

- Creating a cadre of "bare foot engineers"/ technicians as mentioned above is integral to build locally resident skills for design, execution and maintenance of rural infrastructure.
- Imparting degree/diploma in farm technology and veterinary science (2–3 years programme) for rural youth with 10 + 2 school education. This is already being tried out in certain parts of the country and can be up-scaled nationwide.
- The experience with the ASHA programme is encouraging and many of the recruits are very bright and enthusiastic. They feel empowered on account of their new-found social role and they are also likely to remain in the village. A programme can be developed to select bright ASHAs who have a 10+2 school education for a 2–3 year training programme to produce a class of intermediate medical personnel to service the villages. This will have two outcomes.
    - First, they can attend to day-to-day health issues and know when to refer the case to the hospital network.
    - Second, a line of career development thus becomes clearly available to young ASHAs and will encourage and enthuse this cadre.
    - Third, it enriches the villages with locally resident intermediate medical staff who can potentially run the Sub-Centres/PHCs. Finally, it is greatly gender empowering.
- In some states recruits into the ASHA programme have 10 years or less of schooling. Facilities to help them complete secondary and higher secondary schooling can be

designed to go along with their day-to-day work and enable to acquire more advanced skilling subsequently.

- Likewise, rural youth with 8–10 years of school education can be imparted other kinds of skills that relate to both farm and non-farm based activities such as equipment maintenance and repair.

Women and Rural Economy

6.32 Women participate in farm related work, both in agriculture and in animal husbandry. In framing policies/schemes for the Twelfth Five Year Plan, the special needs of women must be taken due care of. *The Mahila Kisan Sashaktikaran pariyojana (MKSP)* which is a sub-component of NRLM was recently launched to meet the specific needs of women farmers, and help them achieve social, economic and technical empowerment. In the Twelfth Five Year Plan very specific attention needs to be given to leverage the enormous potential of empowering rural women in the farm sector, and also in the rural non-farm sector.

Instruments for Intervention

6.33 In order to provide all the inputs that have been discussed above, the instruments for public intervention must be both comprehensive in terms of touching all available institutional arrangements and also participatory. The key areas visualized for this purpose are:

- Strengthening of local (district) planning, supervision and execution
- Encouraging an operational framework, which results in PRI and State Government officials working more closely
- To improve the design of development schemes taking into account the special characteristics of the region/area/culture
- Deepen financial inclusion. This has to be an important component of policy intervention, such that access to the organized credit market should become progressively easier for farmers and rural entrepreneurs. It should build on the existing positive experience of Self-Help Groups (SHGs), Kisan Credit Cards, ongoing experiments with mobile banking and business correspondents, as well as with stand-alone micro financial institutions (MFI). The refinancing arrangements and experience of NABARD should also guide future developments in this area.
- The PPP model should be extensively used wherever possible to build commercially viable infrastructure assets. In the final year of the XIth Plan, a beginning has been made in this direction under the Provision of Urban Amenities in Rural Areas (PURA) programme. This could be appropriately scaled, especially for the rapidly increasing "Census Towns" and clusters of larger Gram panchayats during the Twelfth Plan.

Devolution of Powers and Rural Local Self-Governments

6.34 Rural local self-governance is critical to rural transformation. The 73rd Amendment to the Constitution seeks to endow the Panchayats with such power and authority as may be required to enable them to function as genuine institutions of self-government. Inherent in this devolution is the expectation that it would lead to social justice with economic development and effective local governance with emphasis on :

- social and political empowerment of village communities, particularly of the hitherto marginalized segments
- Accountability of local government functionaries to the elected local representatives
- Greater control of village communities over natural resources

6.35 As Panchayati Raj is included in the State list of the Seventh Schedule of the Constitution, the States are responsible for devolution of powers to the Panchayats and thus need to take steps for effective devolution of powers and authority as envisaged under Article 243G read with the Eleventh Schedule of the Constitution. States have taken up activity mapping based of the principle of subsidiarity, but the pattern of assignment of subjects and the coverage of subjects differs widely among the States. Barring those development programmes/schemes which expressly require the involvement of panchayats, most others are implemented by the functionaries of the line departments concerned. However, there has been an increase in the allocation of funds to panchayats due to the Union Finance Commission awards and State Finance Commission Awards.

6.36 The concept of community empowerment, ownership and management of natural resources was carried forward with regard to Schedule V Areas by the Provisions of the Panchayats (Extension to the Scheduled Areas) Act 1996 (PESA). It was expected that PESA would lead to self-governance and empowerment of the people. However, the implementation of PESA is far from satisfactory. Most of the States have not framed rules for implementation of PESA so far.

7

Farm Sector

7.1 About half of our population is either wholly or significantly dependant for their livelihoods on some form of farm activity – be it crop agriculture, horticulture, animal husbandry or fisheries. With low levels of infrastructure and human development, and in a context replete with inequalities and uncertainty, rural India views its future transformation with both hope and trepidation. Expansion of farm incomes is still the most potent weapon for reducing poverty. Non-farm income opportunities such as post-harvest operations, maintenance of farm equipment etc. – offer a virtuous cycle connecting expansion of farm activity to that of rural non-farm income opportunities.

Farm Sector Growth and Rural Incomes

7.2 The Eleventh Plan had sought to reverse the deceleration of agricultural growth which occurred in the Ninth Plan and continued into the Tenth Plan. It has had some success in that foodgrain production has touched a new peak of 241 million tonnes in 2010/11 and growth in agriculture in the Eleventh Plan is likely to average 3.3 per cent per year compared with 2.2 per cent in the Tenth Plan. However, we need to redouble our efforts to ensure that 4 per cent average growth, if not more is achieved in the Twelfth Plan period.

7.3 Although rural incomes have increased and rural poverty has reduced over the years, the gap between urban and rural incomes has widened quite sharply because agriculture has grown slower than other sectors and because employment growth in non-agriculture has not been enough to sufficiently reduce the population dependent on agriculture. Productivity gains from the Green Revolution reached a plateau by the Eighth Plan end, causing per capita food grain production to decline thereafter. Agriculture did diversify towards horticulture, animal husbandry and non-food crops, but agricultural GDP growth averaged only 1.9 per cent during 1997/98 to 2004/05. Farm incomes increased even less since terms of trade turned against agriculture during this period, indicating inadequate demand and lack of rural purchasing

power. With farm debt increasing more than farm incomes, there was a deficit of hope that was captured tragically by a spate of farm suicides.

7.4 This prevalence of an agrarian crisis, particularly in the rain-fed areas of the country, was confirmed by a Situation Assessment Survey of Farmers conducted by the National Sample Survey in 2003 and also by the Mid-term Appraisal of the Tenth Plan in 2004. The National Development Council (NDC) set up a sub-committee on the subject of agriculture in 2005 and the Eleventh Plan was formulated with input of reports from this, the National Farmers Commission and Working Groups appointed by the Planning Commission. In 2007, for the first time ever, the NDC held a special meeting exclusively on Agriculture where it discussed the Eleventh Plan strategy for the sector and adopted a Resolution on the subject. These consultations established that, in addition to stressed natural resources and very inadequate rural infrastructure, there was clear evidence of technology fatigue, run-down delivery systems in credit, extension and marketing services and of insufficient agricultural planning at district and lower levels.

7.5 Remedial action began even before the Eleventh Plan. Along with a substantial increase in plan allocation and credit for agriculture proper, an ambitious Bharat Nirman for rural infrastructure, the National Rural Employment Guarantee Act (MGNREGA) to dovetail employment security with land and water conservation, and the Backward Regions Grants Funds (BRGF) have enabled *Panchayati Raj* institutions in poorer regions to make their own plans. In addition to enhancing the scope of these initiatives, and making modifications as suggested by the various working groups, the Eleventh Plan introduced the *Rashtriya Krishi Vikas Yojana* (RKVY). This put in effect the NDC resolution to "introduce a new scheme for Additional Central Assistance to incentivize States to draw up plans for the agricultural sector more comprehensively, taking agro-climatic conditions, natural resource issues and technology into account, and integrating livestock, poultry and fisheries more fully."

7.6 There has been a positive response as agricultural GDP growth accelerated to average 3.7 per cent growth during 2005/06 to 2010/11, partly because of initiatives taken since 2004. But this is still below the 4 per cent target set in successive plans from Ninth Plan onward and has not been sufficient to prevent unacceptably high food inflation in a context of very volatile world prices and in the wake of a severe drought in 2009. Nonetheless, although high food prices are clearly a set-back for inclusive growth, this has improved agriculture's terms of trade and prevented further fall in farm incomes relative to overall GDP (agriculture's share in nominal GDP in 2010/11 was about the same as in 2004/05). While this has restored confidence to some extent, inflation itself is causing concern among farmers who are not only facing higher costs and but also adverse effects of certain policies adopted to cope with inflation, e.g. export

bans. Moreover, there are some farmer concerns arising from the effect on wages of MGNREGA.

7.7 The Twelfth Plan will consider all these issues, as well as the weaknesses of existing schemes as brought out in the Mid-Term Appraisal of the Eleventh Plan. Its thrust will be to move forward with the architecture of RKVY and, in particular, focus even more on the sustainability issues. Not only have past patterns of agricultural growth depleted soil and water resources seriously, there is now clear evidence of adverse climate change: the decade that ended in 2009 was the hottest ever recorded and also among the driest.

Demand and its Composition

7.8 On the demand side, a 9 per cent growth of the economy as a whole is expected to generate the demand to support 4 per cent growth in agriculture with foodgrains growing at about 2 per cent per year and non-food grains (notably, horticulture, livestock, dairying, poultry and fisheries) growing at 5 to 6 per cent.

7.9 The challenge is how to feed India's growing population with rising incomes, but limited land and water resources. The economy is expected to grow strongly and, as the latest NSSO survey data for 2009/10 on household expenditure reveals, an average household is still spends nearly half of its expenditure on food and food products. Thus, pressure on food demand is likely to remain strong over the Twelfth Plan period although consumption is likely to be more diversified as cereals now account for only 15 per cent of the total consumption expenditure.

7.10 The food consumption basket is getting increasingly diversified and though cereals still dominate, this dominance is being increasingly eroded by rising expenditure on fruit, vegetables, milk, eggs, meat & fish which together is sometimes referred to as "high value" segment. This transformation of the Indian food consumption basket is in-line with expectations. The NSSO data also shows that between 1993/94 and 2004/05 *per capita* human consumption of cereals increased among the poorest 5 per cent of the population, while it fell among the remaining 95 per cent. The decline was also sharper in rural areas than in urban ones. However, cereals demand for animal feed is accelerating.

7.11 Issues of food security have moved to the forefront of international discussions in recent years and in this context, the question is sometimes asked whether India will be able to feed herself or become dependent on food imports. The fact is that we have been a net exporter of cereals for most years since 1990. In 2010/11, despite bans on export of wheat and non-basmati rice, India exported over 5 million tonnes of cereals comprising 2 million tonnes of *basmati* rice and 3 million tonnes of corn, while simultaneously adding substantially to stocks of

wheat and rice. Also, the balance of evidence suggests that there is enough untapped potential for productivity improvements on Indian farms to enable us to meet cereal demand from domestic production without having to become dependent on food grain imports on a net basis. The key to ensuring long-run food security lies in targeting cereals productivity to grow significantly faster than population so that adequate land becomes available for other agricultural use.

Production

7.12 On the supply side this calls for action on several fronts and the precise mix varies from one agro-climatic zone to the other. However, a matter of national priority from view of both food security and sustainability is to fully extend the green revolution to areas of low productivity in the Eastern Region where there is ample ground water. This will require investment in infrastructure, particularly in power, logistics and marketing. The more general major points of intervention on the production side are identified below:

Water Management

7.13 The first and perhaps the most important component is vastly superior water management. These include a wide and diverse range of problems, objectives and means of resolution, some of which have been discussed in the previous chapter, namely:

- Steps to greatly improve governance in water management through Water User Associations such as *Pani Panchayats* and similar PRI-based institutions.
- A focus on Command Area Development and the rehabilitation and physical modernisation of existing major irrigation systems.
- Extensive rainwater harvesting assisted by space-based maps with active ground-truthing and convergence with other development schemes.
- Comprehensive aquifer mapping and extensive ground water recharge.
- Move towards sprinkler and drip irrigation and away from flood irrigation
- Enable assured irrigation to much more land far beyond the present 42 per cent of arable land
- Strengthen drinking water resources
- Integrate these activities with existing surface reservoir based canal irrigation.

7.14 Micro-irrigation schemes to reach water access to more areas and encouragement to efficient methods of water-use is a natural extension of the extensive efforts in rainwater-harvesting and decentralized impounding of water, including that in farm ponds. Imaginative use of these initiatives can enable an assured protective irrigation for less water intensive crops in the rainfed regions.

7.15 Presently, there are several agencies that are presently involved in watershed management and rain fed area agriculture. Institutional changes by way of a unification of these agencies could permit for better co-ordination and results on the ground.

7.16 The exact mix of these interventions will vary from place to place and only a locally grounded agriculture development strategy can successfully capture the problem and achieve the most desirable outcome. Such local strategies will be even more effective if the meteorological predictions can be made more reliable.

Soil Nutrient Management

7.17 The second major input that is needed is the preservation of soil fertility and nutrition management. Soil is the basic natural resource that supports life on earth. Millions of small organisms live in healthy soil which is rich in organic matter. A living soil ecosystem nurtures and nourishes plants by providing a healthy medium to take roots and through a steady supply of nutrients. Indiscriminate use of synthetic chemical fertilizers can seriously disturb the natural soil ecosystem. Chemical fertilizers are highly subsidized in India and the amount of fertilizer subsidy has grown exponentially during the last three decades from a mere Rs. 60 crore in 1976/77 to an astronomical Rs. 61,264 crore in 2009/10 and likely to exceed the budgeted subsidy of Rs. 58,000 crore in 2010/11. Such heavy subsidies often encourage unbalanced soil nutrition. Although there is still a need to increase fertiliser use in many parts of the country, the overuse of chemical fertilizers in many other areas has resulted in severe degradation of soils. Since synthetic chemical fertilizer use is conditional upon assured availability of water, the water constraint in rainfed areas demands exploring alternative ways of enhancing soil fertility.

7.18 The way forward is to rejuvenate soil and restore soil health through addition of soil organic matter in bulk quantities and also micro-nutrients. Balanced nutrient management will gradually ameliorate the effects of unbalanced/excessive use of chemical fertilizers. Support for soil amelioration and ecological/organic fertilization is now scattered under various schemes and will require a clearer focus, along with much better assessment of soil health and nutrient needs at the farm level.

Efficiency in Use of Chemical Fertilizers

7.19 Since agriculture will continue to require the use of chemical fertilizers, and their intensification in many areas, policy must encourage application of customized or appropriate mixtures relevant to the soil conditions and to specific crops. The ongoing change in the subsidy regime to nutrient-based subsidy (NBS) and deregulation of retail price must be completed soon to improve nutrient uptake efficiency and minimize waste and contamination of groundwater and water bodies. Application of customized mixtures and slow release forms of

fertilizer, combined with micro-biological cultures, will have the threefold effect of (a) improving the efficiency of fertilizer use and therefore of the large subsidies involved, (b) preventing contamination of ground water and (c) improving the nutritional status of the soil by working in a complementary manner with the natural eco-system of the soil.

7.20 Existing policy needs to be improved through a change incorporating best practices of soil fertility management. These include:

- Adoption of a farming systems approach with livestock and commons as an integral component of the farm;
- Generation of biomass for bulk addition of organic matter in the soil to maintain proper soil health. We should educate the farmers not to burn standing crop residue but to plough it into the soil;
- In situ degeneration of biomass through sole cropping/inter-cropping/bund cropping of green manure crops;
- Recycling of farm and household waste through use of intensive nutrient recycling methods such as composting, including the use of vermiculture;
- Producing and encouraging use of bio-fertilizers at regional and local levels, along with adoption of bio-dynamic farming methods;
- Crop rotations to enrich soil (e.g. to include pulses and leguminous crops). Multiple cropping which enriches soil should be encouraged instead of mono-cropping;
- Pooling existing soil testing data into a System of Soil Nutrition Management (SSNM), which will enable much better-informed soil nutrition management and quality extension work; and
- Integration of the activities of ICAR institutions, State Governments, fertilizer and seed companies and other agencies to generate synergy.

New Technologies for the Farm Sector

7.21 Technology is the main prime mover of productivity in agriculture where natural resources are fixed. Studies have shown that at least one third of the future growth in productivity should come through innovations in crop technologies. Public sector technology generation often fails to take into account farmers' needs, perceptions and location-specific conditions for each crop, leading to significant gaps between the varieties released by public sector institutions and the number of varieties actually used by the farmers. Private sector research and the seed industry often focus on those crops and varieties which have adequate scale (massive markets) and scope (repeated sales). As a result, some crops/crop groups get little research attention. This phenomenon is most visible in predominantly rainfed crops like pulses and some oilseeds, which are in crying need for a technological breakthrough. For instance, per capita net availability of pulses has remained stagnant at the level of around 40

grams per day since early 1990s, indicating very slow growth of production and yield. India imports a very significant proportion of its requirement of edible oil. Significant breakthroughs are required to improve production technologies of these predominantly rainfed crop groups. Moreover, since climate change will require coping with increased stress, it is necessary to remain abreast with latest advances in bio-technology and make full use of marker-assisted breeding methods. An acceptable set of protocols and a clearly defined regulatory mechanism are required so that transgenic food crops can be cleared if advantages of doing so vastly outweigh any precautionary misgivings.

7.22 Investment in agricultural research and development to bring out new varieties and breeds for a wide range of crops and animal resources is a priority in the farm sector. India's expenditure on agricultural R&D and education is currently about 0.6 per cent of the GDP from agriculture and allied activities and this definitely needs to be raised at least to 1 per cent. Technology generation in India is largely undertaken by the public funded National Agricultural Research System (NARS) comprising the ICAR and State Agricultural Universities (SAUs). A worrying feature is that States currently under-fund SAUs, leading to both shortage of skilled human resources and of location-specific problem solving. Central funding of NARS must therefore involve ways of incentivising adequate State spending. This is particularly so in the case of rainfed agriculture where there is a need for different ways of working in these public research organizations. The shift from mere technology generation to greater understanding of contexts is imperative; with enhanced research on seasonality, location-specific soil-crop-water interactions and linkages with other rural resource demands like drinking water. Successful varietal development for rainfed areas is possible only if decentralized research and information generation are tuned to agro-climatic features at the district and block levels, with participatory research and extensive infrastructure and facilitation of local seed banks. The latter will be a necessity for responsive seed replacement and support in the event of climate variability and change. Increased allocation to research and extension must go hand-in-hand with institutional changes in public sector R&D and in the role mandated for Krishi Vikas Kendras (KVKs).

7.23 Technology dissemination is currently being augmented by extension reforms through the Agricultural Technology Management Agencies (ATMA) at district level. These attempt to integrate the current extension work within Departments of Agriculture (which are under-staffed and rely on transfer of technology with almost no feed back into research and policy) with KVKs and also active participation of farmer groups, private sector and civil society organizations (CSOs), PRIs and other key stakeholders working at district level and below. Presently, the experience has been somewhat mixed, with the model working well where the rest of the agricultural system is also working well and vice versa. Special effort needs to be taken to transfer learnings from more successful areas to others so that the ATMA model can live up to its expectations. The ATMA concept needs to be strengthened, although possibly not as a stand-alone scheme. On the development side, extension involves planning and its

implementation so that ATMAs are best suited to operate as the domain agency reporting to District Planning Committees. On the technical side, there is need to much better integrate into ATMAs the problem-solving capacities of KVKS and the feed-back loop these offer to SAUs and NARS. The guidelines of RKVY need a re-look so that ATMAs and KVKs can together bring better convergence at district and below between planning, research and extension.

Rainfed Agriculture

7.24 Within the farming sector, rainfed agriculture is a major constraint in raising overall agricultural growth and bridging regional inequalities. Some 200 million hectares in India constituting 62 per cent of the total geographical area of the country fall in this category and represent the geography with the largest concentration of poverty. They span several agro-ecological regions.

7.25 Productivity of rainfed agriculture has lagged, causing widespread distress. This is due to inadequate support in terms of soil management, seed availability, provision of water, support price, market access, agricultural research investments, etc. The most visible aspects of this distress are farmer suicides on the one side and the rising tide of left wing extremism on the other. But even at their low land productivity levels, the absolute contribution of rainfed agriculture is by no means small. It accounts for 56 per cent of total cropped area, 48 per cent of the area under food crops and 68 per cent of that under non-food crops. In terms of crop groups, 77 per cent of pulses, 66 per cent of oilseeds and 45 per cent of cereals are grown under rainfed conditions. As estimated by the *Technical Committee on Watershed Programmes in India* (2006), even in the best possible scenario of irrigation development, about 40 per cent of the additional supply of foodgrains (and even more of oilseeds and animal products) needed to match future rise in demand will have to come from the rainfed segment of Indian agriculture.

7.26 However, the rise in productivity will not come from a mechanical extension of the water intensive Green Revolution model. A comprehensive policy package needs to be visualized to revitalize rainfed agriculture. This package must be a combination of several locally relevant components, designed to enhance the productivity of rainfed farming working within water constraints and stabilize or enabling inter- and intra-seasonal risk-proofing of rainfed production systems. Since the key to all this is more local planning, it is heartening to note that agricultural growth during the Eleventh Plan is likely to be higher in rainfed than in irrigated areas, in part because of the incentives and flexibility offered by the architecture of RKVY. Nonetheless, the present situation demands that this framework be extended to encompass more fully livelihoods, agriculture and nutrition in the rural areas in India's dry lands.

7.27 The Twelfth Plan must envisage and enable the convergence between livelihoods, availability and access to food, ecosystem and human health. Water management plays a key

role in achieving a breakthrough in rainfed agriculture; watershed development has been a major support enabled by the state through its own schemes and in partnerships with several private and voluntary sector organizations. But the kind of transformation sought in agriculture and food security is possible only with greater attention to other components of rainfed farming, with substantial investment and policy support. This will take resources to put in place necessary supporting infrastructure but it is worth keeping in mind that rainfed areas produce the current levels of foodgrains, pulses, oilseeds, with a mere 6-8 per cent of the expense of national (irrigation, fuel and fertilizer) agricultural subsidies. The National Rainfed Areas Authority which was set up as an expert advisory body to aid convergence between activities of different departments has so far had only limited success. This is now attached to the Planning Commission, which may improve its influence at State and lower levels, particularly if steps are taken to widen its footprint by having regional centres that help to co-ordinate expertise with NARS and Civil Society for better implementation of plan activities in the rainfed areas.

7.28 Policy should encourage the production and consumption of millets which is a rich source of nutrition, and has been a part of the traditional diets of communities in many parts of India. Emphasis on local production and local procurement/purchase of millets should be linked to both the ICDS and Mid Day Meal programmes in such regions.

Seed Systems

7.29 Seeds are a critical input for long-term sustained growth of agriculture. Timely availability of certified quality seeds with good yield potential continues to be a major problem. In India, more than four-fifths of farmers rely on farm-saved seeds leading to a low seed replacement rate. Concerted efforts are essential in ensuring timely availability of seeds as well as increasing the Seed Replacement Rate (SRR). The responsibility of ensuring adequate seed availability to the farmers lies with the agencies involved in making available certified seeds from the breeder seeds. Since the private sector has emerged as the major source for hybrid seed and other planting material especially in the high value segments, it is necessary to review comprehensively the structure of subsidies and certification in the seed chain so that farmers have better choice and quicker access without diluting regulatory standards.

7.30 Rainfed areas are vulnerable to high climatic risks and the seed systems have to be oriented towards meeting shortages on account of this risk. In rainfed areas, wastage of seed due to prolonged dry monsoon spells immediately after sowing is a very common occurrence. In such a situation maintaining seed diversity is important from the point of view of reducing rainfall risks. There has to be an assured availability of a second batch of seeds for repeat sowing, if the first sowing fails. In cases of prolonged dry spells, the local seed systems must be capable of providing seeds of contingency or alternative crops. Fodder seeds are always a scarce resource which local seed systems could produce and supply.

7.31 A programme of seed villages could ensure that a range of seed material is maintained within the village. A possible method of doing this is through creation of community level seed banks with buffer stocks of seed material for various crops. These can be designed to cover a specified village/area, depending on the extent of purchased seed and the rate of seed replacement. These seed banks should be considered as a necessary common infrastructure for rainfed farms supported by the government on a regular basis. Over time, these seed centres may become autonomous and self-reliant.

Promotion of IPM/NPM Practices and SRI

7.32 Successful adoption of NPM (Non-Pesticidal Management) and SRI (System of Rice Intensification) in several rainfed and irrigated cropping systems in the past decade, has led to increased policy and research attention to these systems. While some state governments, Andhra Pradesh, Tamil Nadu, Bihar and Orissa have been particularly attentive to increased adoption of these productivity enhancing, cost-effective and eco-friendly production practices, a nation-wide support for such knowledge-intensive (as opposed to input-intensive) alternatives that are ideal for rainfed areas, is still missing.

7.33 Use of chemical pesticides in India jumped from 154 tonnes in 1954 to about 90,000 tonnes in 2008 at an average of 0.5 kg/ha. The use of pesticides is high in a few states such as Andhra Pradesh, Karnataka, Maharashtra, Gujarat and Punjab (accounting for nearly 40 per cent of total pesticide use in the country). The liberal and continual use of pesticides has disturbing consequences on the farming system, particularly due to the development of resistance, resurgence of insect pests and decline in population of the natural enemies of pests. Several organic and bio-pesticides have been shown to be more effective in managing crops in an environmentally sustainable manner. However, there is the need to substantially step up investments in research and technology development in such options, enable local access to expertise on pest-host interactions, and access to quality products for pest management. These options could also be based on locally available resources, which will go a long way in reducing the cost of cultivation in farming. The agricultural research system could conduct multi-location field trials in different crops to identify crop-and location-specific methods of Integrated Pest Management (IPM) and Non-Pesticidal Management (NPM), in a participatory research framework.

Land and Tenancy Reforms

7.34 Legislation regarding ceiling on land ownership has not had the impact to the extent that was envisaged because redistribution of land declared surplus is being held-up on account of litigation. There are numerous cases that have been reported, where the title deeds (*pattas)*

are not in the possession of the beneficiaries and there have been many *benami* transactions which together serve to defeat the purpose of the legislation. Issues of land rights are also a major problem in the case of land on which tribal people have had customary use. In the Twelfth Plan, effort must be made to deal constructively and effectively with these outstanding matters.

7.35 At the same time, there is need to give a fresh look at tenancy legislations. These need to permit leasing of land where small farmers, who would otherwise be unviable, are able to lease out their lands to others able to bring in the other inputs needed. The small or marginal land owner may even be employed on the land by the new tenant farmer. There is also need to record small and marginal tenants so that they can access credit without threatening future rights of the land owner. The key to both these is that leasing should be possible without jeopardizing the property rights of the original land owner.

Livestock and Fisheries

7.36 Dairy farming has a led to the opening up of new income opportunities for the rural households and is an important instrument which provides the opportunity not only to fight poverty but also improve nutritional outcomes in rural families. While the dairy industry has done reasonably well in the past, there is considerable scope to improve its potential. Inadequate fodder availability, poor access to cattle health centres and low yields associated with inadequate progeny standards are constraints that need to be tackled. During the Twelfth Plan, the dairy sector will be strengthened under the proposed National Dairy Plan. This should supplement efforts of Animal Husbandry Departments in areas of progeny tested semen for artificial insemination and expansion of fodder availability through innovative means. Simultaneously, facilities of animal health centres need to be upgraded and the disease control systems made more effective on the veterinary side. Similarly, in the area of fishing, there is need to clearly define the role of Fishery Departments and the National Fishery Development Board, with the former concentrating more on policy and fishers' welfare while development activities are increasingly taken over by the latter.

7.37 In the drylands and mountain ecosystems, livestock contribute anywhere between 50 to 75 per cent of total household income of the rural population. Support to these massive and highly diverse livestock populations in these regions is lacking. A comprehensive programme is necessary that specifically raises the capability of the rural poor to conserve and manage their livestock and fisheries resources, and enables them to derive sustainable incomes from these resources. The programme should focus on the dependence on rural poor on small ruminants like goats, pigs and promote a range of fodder options for them. Decentralisation and

convergence of policy support for these options is crucial for diversification of livelihoods in small-holder farming.

Linking Small Producers with Markets

7.38 Small and marginal farmers now constitute over 80 per cent of farming households in India. They have only very small quantities of marketable surplus. Moreover, their staying power is low because of their extreme poverty. As a result, these farmers sell off most of their produce in the local markets at very low prices immediately after the harvest. Thus, farmers suffer even in years of a good harvest, since they are not able to get good price realization. The obvious solution is for these farmers to aggregate their produce and reach bigger markets where they can get a better price for their produce. This was the original idea behind Marketing Co-operatives but these have effectively delivered only in some limited cases. Alternative models based on the idea of Producers' Companies and Commodity Interest Groups are now beginning to take off. Moreover, with the growth in the Self Help Group (SHG) movement and development of SHG Federations across the country under the NRLM, options for crop produce aggregation and collective marketing are widening. Banks could fund this activity, with the use of liquid instruments like warehouse receipts. The idea is to collect the produce of the members of the co-operative, producer companies or SHG federations, aggregate the produce, put it in the local warehouses and borrow from the banks against the warehouse receipts. The system of warehouse receipts has begun to operate only recently. The institutional structures, including a regulator, are now in place and it is expected that the Twelfth Plan period will see substantial volumes flowing through the system.

7.39 As per existing rules, banks provide a credit upto 75 per cent of the value of the produce as a loan to the producer. The Member-driven body (SHG federation, co-operative or producer company) can use this money to distribute to its members to take care of their immediate consumption and other needs. When the price in the market goes up, this body repays the bank loan, releases the produce from the warehouse and sells it in the market.

7.40 Basic infrastructure in rural areas for storage and marketing of produce needs to be set up to link producers with regularly functioning markets. Small multi-functional units like warehouses, providing value added services for the farming community, should be encouraged. Banks and other financial institutions in villages need to provide the required finance to the entrepreneurs in this field and may be motivated to extend credit to the setting up of such units if they receive support from the Government as such activities could be capital intensive. Opportunities for value addition of the aggregated produce should also be considered. District and lower level planning must have a specific component for mapping the requirements of processing/ value adding infrastructure. The infrastructure should include common storage

places for seeds and other agriculture inputs and agriculture produce within the village and at the bulking points.

Crop Insurance

7.41 Small and marginal farmers, particularly rainfed farmers face partial or total crop losses due to risks associated with farming. Of these some (like the pestilence problem) are under the control of the farmers but risks associated with weather fluctuations are beyond their control. The traditional coping mechanisms of the farmers for addressing these risks are not adequate and their distribution is highly uneven. Crop insurance has come up as an important tool for risk mitigation for small and marginal farmer households in particular. It is well known that only less than 10 per cent of the farmers in India are covered with currently prevailing crop insurance products. The key weaknesses of current crop insurance products arise from the nature and distribution of risks associated with farming. For instance, climate risks are often highly spatially correlated and an area-based approach comes up with estimates of huge losses which could be beyond the capacity of the insurer to pay. The long-tailed distribution of risk, with events of high severity occurring at a low frequency, puts the price of conventional crop insurance products beyond the reach of small and marginal farmers.

7.42 The principal crop insurance scheme is the National Agricultural Insurance Scheme (NAIS) which presently encompasses subsidy on 10 per cent of the premium to small and marginal farmers, with the expense on the subsidy being equally shared between Centre and State Governments. The scheme is demand driven and although a large number of farmers (11.4 million in *kharif* 2010) availed of this programme (with the total sum insured being Rs. 25,500 crore), the fact is that not enough farmers are availing of this scheme. The reasons are believed to be a combination of lower subsidy, delayed claim settlement, lack of awareness and operational issues. In response to this a modified NAIS has been implemented on pilot basis in 50 districts covering most states, with a slightly different design, including higher subsidy and accelerated settlement. The MNAIS scheme is yet to be rolled out in the rest of the country.

7.43 All these point to the need for innovative insurance products such as weather-based crop insurance based on a deficit rainfall approach. Since rainfall is an objective parameter measured independent of the insurer as well as the clients, the moral hazard associated with conventional products does not exist here. Effectiveness of the product largely depends on synchronizing the policy initiation date and the sowing date and in calculating compensation based on actual rainfall in each village. We need to increase the density of rain gauge stations to get good insurance products capable of offering customized services at a village scale. We must also remember that crop insurance as a risk mitigation measure is effective only in combination with risk reduction measures like soil and water conservation, use of seed varieties

with good yield potential, adoption of sustainable agricultural practices, inter-cropping and diversification of cropping pattern. Hence, the pre-requisites for good crop insurance models are:

- Research to evolve location specific insurance products;
- Capacity building of various stakeholders like farmers' organizations, SHGs, cooperatives, banks and insurance companies to offer viable and robust crop insurance products;
- Insurance education for the small and marginal farmers;
- Investment in infrastructure like automatic rain gauges and data collection systems;
- Favourable regulatory environment for various insurance delivery institutional mechanisms; and
- Adoption of a comprehensive agricultural package for reducing risk associated with farming, especially in rainfed areas.

Improving Marketing and Logistics

7.44 Road connectivity, development of horticulture, dairying & other animal husbandry and expansion of cash crops, provide the necessary wherewithal for greater market access of the farm sector. This is particularly important for the segment of "high value" agriculture, where the demand pressures are going to be most intense in the coming years, and major investments are needed in the development of efficient value chains to save on high wastages and intermediation costs. This is logically the domain of the private sector, but significant reform in the institutional set up is necessary for such investments and capacities to be realized. Unless this part of the chain is modernised and private investment drawn into it, the intermediation process for farm products, especially perishable products, will remain antiquated with considerable wastage, low net realization to the farmers and high consumer prices.

7.45 The inadequate facilities for storage of products also results in considerable fluctuations in the price of products through the season. There is a great imperative to modernize the logistics of farm produce and achieve that through a combination of favourable policy and private investment and initiative. The necessary steps include:

- Reform of APMC Acts to allow private sector markets and also contract farming should be a priority. If full amendments to the APMC legislation are hard to achieve, we should at least free perishable products from regulatory provisions so that a national market can emerge for these. While a few State Governments have gone a significant distance by amending the APMC legislation, more State Governments seem to be adopting an ambiguous position. While accepting the need for reform they are hesitating to move

decisively forward on this issue. This was an important item in the 2007 NDC resolution that is yet to be implemented fully.

- Encourage involvement of private investment, including corporate retail, either directly or through contractual arrangements, in cold-chain and food processing activities.
- Strengthen rural electric power distribution, such that modern storage and processing facilities can become technically viable in these areas.
- Ensure last mile connectivity, so that private investment can be more forthcoming across the nation. Encourage corporate retail to tie-up with local aggregators, whether these are Co-operatives, Producer Companies, SHG Federations, or rural entrepreneurs.

Common Pool Resources

7.46 Common pool resources (CPRs) or "commons" play a key role in household food security in many parts of the country characterized by rainfed agriculture and mixed farming systems. Several studies have shown that in rainfed regions the subsidy derived from CPRs forms a critical contribution to both livestock and agricultural production systems. The commons-livestock-agriculture interface is the foundation on which multiple production systems of rainfed areas derive their resilience from. NSSO 54th Round estimated that the share of common pool land resources in the total geographical area of the country was around 15 per cent. Chopra and Gulati (2001) have re-classified India's Agricultural Land Use Statistics data for 1991 to estimate the extent of common pool resources in 16 major states. Adopting this methodology, they estimate that the share of common pool land resources is around 26 per cent of the total geographical area of the country.

7.47 In rainfed regions the subsidy derived from commons forms a critical contribution to both livestock and agricultural production systems. Hence, we need to strengthen the symbiotic relationship between commons, livestock and agriculture. This calls for a shift in orientation towards viewing commons in a livelihood framework as an essential part of the survival strategies of farming households. The critical role that commons play in livelihood security in rainfed regions should inform the current ongoing discussion on the "productive use" of the commons.

7.48 For revitalizing the commons and strengthening the production systems of rainfed areas, the following measures need to be adopted:

- Formulating "Commons Policy" emphasizing the security of tenure to the user community;

- Initiating a community-led process of recording claims, verification and consolidation of community rights on common lands and to get such rights recorded in Record of Rights at *Gram Panchayat* level;
- Devolving management and use rights of commons to village/habitation institutions as part of the decentralization process;
- Stepping up public investments (to the extent of Rs 20,000 per hectare) for revitalising common land and water resources; a large proportion of these investments can be met through convergence with MGNREGA;
- Developing a programme architecture at district and at sub-district level aligning interventions on CPRs within the larger natural resource management programmes;
- Constituting an overarching planning and regulating authority at the district level where sectoral plans on agriculture, water, forests, industry and infrastructure are nested; and Creating a robust database on common land and water resources as a decision-support to sustainable use of CPRs.

Expected Output

7.49 The combined outcome of the above listed initiatives should result in significant increase in farmers' incomes and in food production both in terms of quantity, quality and range. In the backdrop of the price trends in the international food markets, it is clear that we would be prudent to plan for not only self-sufficiency in basic food production, but also to maintain a surplus. This surplus can contribute to meeting critical food shortfalls in the neighbouring countries of the region and would help to strengthen a peaceful climate in the region. In the case of fruit & vegetables, milk eggs, meat & fish and also of pulses, there is a need to ensure that output grows at a rate significantly faster than that of cereals so as to service the expanded demand in these areas. Overall, during the Twelfth Plan period annual output growth of about 1.8 to 2 per cent is envisaged for cereals with rice output likely to grow by around 2 per cent. The output growth rate for pulses will have to be stepped up. Thus, the overall foodgrain output is expected to be around 2 per cent or slightly higher. Horticulture and animal husbandry products are expected to register output growth of 4.5 to 6 per cent, while that of oilseeds are expected to exceed 3 per cent. Overall, that would give an output growth in the sector of between 4 and 4.5 per cent.

7.50 The expanded output of the rural sector is expected to impact rural livelihoods in the following way.

- Higher productivity in farming
- Higher value for farming especially in horticulture, dairying and animal husbandry

- Expansion of scope for supportive services which include rental for farm equipment and fees for providing mechanized services such as tilling, sowing and harvesting.
- Major expansion of post-harvest activities, including storage and processing.
- Expansion of services that relate to equipment maintenance and transportation.
- Encouraging the establishment of small and medium sized agro-based industries.
- Expanding the scope for non-agro based small and medium industries wherever it may be feasible.

At another level, the output should be reflected in greatly improved health and nutritional outcome. This would not only be a result of higher rural incomes, but also the availability of more locally produced nutrition, as well as intensive monitoring and effective intervention through government programmes.

7.51 Finally, the result of these initiatives should be seen in improved schooling outcomes, as well as much greater dissemination of employment related skills. In order to provide all the inputs that have been discussed above, the instruments for public intervention must be both comprehensive in terms of touching all available institutional arrangements and also participatory. These issues have been discussed in the previous Chapter.

8

Manufacturing Sector

8.1 The Eleventh Plan has targeted growth in manufacturing at 10-11 percent but actual performance will be only about 7.7 per cent. It is a matter of concern that the manufacturing sector has not shared in the dynamism of the economy not just in the XIth Plan, but even in preceding Plan periods. As a result, the share of the manufacturing sector in GDP is only 15 per cent in India, compared with 34 per cent in China and 40 per cent in Thailand. The slow pace of growth of the manufacturing sector at this stage of India's development is not an acceptable outcome. Manufacturing must provide a large portion of the additional employment opportunities required for India's increasing number of youth. Agriculture cannot be expected to provide more jobs. On the contrary it should be releasing labour which has very low productivity in agriculture to be absorbed in other sectors. While the services sector has been growing fast, it alone cannot absorb the 250 million additional income-seekers that are expected to join the workforce in the next 15 years. Unless manufacturing becomes an engine of growth, providing at least 100 million additional decent jobs, it will be difficult for India's growth to be inclusive.

8.2 India's balance of trade must be managed too. The growth of the Indian economy is sucking in imports – of energy, as well as a whole range of manufactured goods (capital goods and manufactured intermediates/components). To balance trade, the country's export basket must include a much larger volume of manufactured goods. The country cannot just increase raw material exports and import finished goods. Nor can India rely on its exports of services alone to bridge the gap, since tradable services such as IT enabled services; though growing very robustly cannot maintain this growth. Therefore, to increase exports as well as provide its internal market with domestically produced manufactured goods that compete with imports, India must manufacture a much larger volume of products at competitive costs and quality.

8.3 The need to sharply change the growth trajectory of India's manufacturing sector requires a holistic appraisal of what needs to be done to improve the competitiveness of the sector. . Some sectors of Indian manufacturing are doing very well internationally, such as the auto industry (particularly component producers), pharmaceuticals, and IT-enabled engineering

services. These successes give insights into the sources of competitive advantage for Indian manufacturing which could be developed into a broader strategy applicable to larger parts of the manufacturing sector. Also, a comparison of the policy approaches taken by other countries that have grown their manufacturing sectors much faster than India (such as Korea and China), as well as those that continue to maintain very strong manufacturing sectors (such as Germany and Japan), can give insights into changes we may make in our policy approach.

Opportunities and Challenges

8.4 The shape of global manufacturing supply chains has been changed dramatically with the application of computers and telecommunications. Manufacturing has been 'de-constructed'. Cost advantage used to be obtained through 'scale' in large factories – a well-known example of the paradigm being large integrated auto plants in Detroit. Now activities in the value chain can be dispersed across the world to combine the best with the best – such as back-end engineering services in India and Japan, component production in China and India, and assembly in many countries. Moreover, producers of manufactured products must respond more rapidly to changing market needs. Product life cycles are reducing and the variety of options manufacturers must provide to their customers is proliferating. Therefore the ability to engineer products quickly and at low cost is becoming an increasing source of competitive advantage. The proof of this is in the success stories of India auto manufacturers, auto parts producers, pharmaceutical companies, and its IT-enabled services industry. Taking advantage of domain knowledge built in their enterprises over many decades (which they were compelled to by India's lack of foreign exchange to allow imports in the 1970s and 1980s) and using high quality and low cost engineers from India's IITs and other engineering schools, such firms are considered amongst world leaders in 'frugal innovation and frugal manufacturing'.

Integrating into global networks

8.5 Building protective walls for shielding Indian manufacturers is neither an appropriate nor a feasible strategy in a world where trade is open. India's manufacturing strategy must build upon its competitive advantages in a changing global manufacturing landscape. Abilities to work within networks (and also to design and engineer rapidly) have become critical sources of competitive advantage. Scale remains an advantage no doubt. But in many industries, scale can be obtained by growing networks rather than building massive factories. In fact, the smallness and nimbleness of Indian manufacturers, supported by software, can be their sources of strategic advantage in the new world of manufacturing, where competitiveness is in the 'scope' of a networked enterprise, not the 'scale' of its units.

Improving Physical Infrastructure

8.6 A significant part of the supportive framework to enable manufacturing to expand rapidly in line with both domestic and overseas demand is the rolling out of adequate physical infrastructure support including electric power, railways, roads and ports. Poor infrastructure, especially power, is a major constraint on competitiveness especially of SMEs who cannot afford to build their own infrastructure.

The Role of SMEs

8.7 SMEs provide the foundation for the manufacturing sector in all large manufacturing countries, whether Germany, Japan, the USA, or China. Even in India, SMEs have been a major contributor to generation of employment within the manufacturing sector, and even to its exports. India has rightly abandoned the approach of reserving sectors for its SMEs and in its place it has adopted the more sustainable approach of nurturing competitive SMEs. SMEs absorb technologies and improve their productivity most effectively within industrial clusters around larger enterprises, preferably linked with technology institutes, A strategy for growing innovative and competitive manufacturing enterprises, small as well as large ones, in India must be to stimulate the growth of dynamic clusters. Difficulties of acquiring land and poor infrastructure are serious handicaps for Indian manufacturing enterprises. The clustering of enterprises, along transport corridors and adjacent to ports, also enables the provision of good infrastructure to them.

Skilled Workforce

8.8 Skilled human resources are necessary for competitive manufacturing enterprises. Skilled workers are one component of the human resource pool. Since India has a large pool of people to be employed, a dynamic skill development process linking industry needs with training processes, can give Indian manufacturing a huge competitive advantage. Good manufacturing supervisors and managers are another component. They are essential for the competitiveness of manufacturing enterprises. Indeed, they are the key to the coordination and continuous improvements that are required for productivity. The best of India's engineering graduates no longer work in factories. They work in IT service industries and many, going through management schools, end up working in the financial, consulting, and other service industries! Manufacturing must be made, once again, an attractive career for India's best talent.

The Cost of Doing Business

8.9 Two other challenges that beset manufacturers in India illustrate the nature of solutions required to attract more investments into manufacturing. The 'cost of doing business' is much higher in India than in other countries due to the plethora of forms and inspections that

manufacturers have to comply with, some of them arising out of legislations long pending review, such as the Factories Act. The streamlining of these requires action by government agencies in the states and in the Centre. Action has begun and thereby some states are becoming more attractive for investments.

8.10 Another challenge is to provide more flexibility to employers to adjust employment levels which also providing more fairness and security to employees. The solution cannot be restricted merely to modifying laws such as the Industrial Disputes Act to permit hire and fire. New institutional arrangements are required to provide security for employees before existing legal safe-guards for them can be reduced or altered. The evolution of such institutions, as well as development of employee-employer contracts founded on new principles, requires wider stakeholder involvement and consensus. At the national and state levels, unions and employers' associations must engage in a well-conducted constructive dialogue to build trust and find new institutional solutions. Such solutions can take the forms of unemployment insurance and staffing companies. Institutionalised processes of consultation between managers and workers within manufacturing units, as exist in several enterprises, must be widely applied in all units. The quality and conduct of representation institutions on both employers' side and employees' side must be strengthened too. In short, the solution to the fairness-flexibility conundrum is not only in changes in laws but also in building and strengthening institutions.

A New Policy Paradigm

8.11 The persistent failure of India's manufacturing sector to meet expectations suggests that a radical change in the policy approach towards it is needed. We cannot continue the way we have been. The 'coordination' challenge in growing the manufacturing sector is complex. The range of inputs required for manufacturing enterprises is larger than for enterprises in other sectors. The linkages within the manufacturing sector are many too: between raw material producers, capital goods' producers, component producers, and assemblers. Policies that favour one segment may harm another.

8.12 With rapid changes of technologies in various industries, and the open international trade environment within which domestic manufacturers must compete, responses by producers and policy-makers must be dynamic. Recent analyses of the growth of the manufacturing strengths of countries reveal that, whereas the industries these countries focused on and policies they adopted differed, all the successful countries had one thing in common. They had a very good process for consultation between producers and policy-makers and coordination amongst the policy-makers. Therefore the paradigm of planning in manufacturing must shift from 'planning as allocations' to 'planning as learning', and from

budgets and controls towards improving processes for consultation and coordination. In India we have rightly given up the paradigm of allocations and quotas to plan industry and there is no question of reverting to it. However, not having mastered the other paradigm yet, we have not been able to grow our manufacturing sector as fast as we should.

8.13 The design of processes of consultation, coordination, and learning, must fit a country's political and economic structures. China's policy approach fits its political economy, as do Japan's, Korea's, and Germany's. The development of a good architecture for a consultative policy making process, and facilitation of its conduct, is what 'planning' for manufacturing growth has to be about. The challenges to developing and implementing a cohesive manufacturing strategy in democratic India are many:

- There is a multiplicity of ministries dealing with different aspects of industry e.g. commerce, labour, environment, science, finance, etc.
- The states have a major role in facilitating the growth of manufacturing in terms of provision of infrastructure, management of various local regulations, and managing labour related law
- Industry associations lobbying for their members' (often conflicting) interests are important stake holders
- Other stakeholder groups who must be involved in the consultations in a more systematic and productive way are: - unions, land owners, etc.
- There are many over-sight bodies and committees, perhaps too many: there is need to sharpen their roles and improve co-ordination amongst them too

8.14 Cohesion can be brought about through more effective coordination amongst agencies, and more effective consultation amongst stakeholders. The success of the Indian auto sector can be attributed significantly to the long term plan prepared a few years ago, collaboratively by the Society of Indian Automobile Manufacturers, the Association of Component Manufacturers of India, and the Ministry of Heavy Industry, involving other agencies too. Such plans are required in other sectors too.

8.15 There are also issues that cut across many industries, such as laws and institutions relating to labour and land, in which solutions must involve stakeholders. Therefore the Approach to Manufacturing for the XIIth plan must be to focus explicitly on improvement of the collaborative process of shaping manufacturing policies while creating the content of the Manufacturing Plan.

Objectives & Components of the National Manufacturing Plan

8.16 India's strategic objectives for the manufacturing sector in the next 15 years should be to bring about a quantitative and qualitative change via a set of policies and plans with the following five objectives:

a. Increase manufacturing sector growth to 12–14 per cent over the medium term to make it the engine of growth for the economy. The 2 to 4 per cent differential over the medium term growth rate of the overall economy will enable manufacturing to contribute at least 25 per cent of GDP by 2025.

b. Increase the rate of job creation in manufacturing to create 100 million additional jobs by 2025. Emphasis should be given to creation of appropriate skill sets among the rural migrant and urban poor to make growth inclusive.

c. Increase domestic value addition and technological "depth" in manufacturing.

d. Enhance global competitiveness of Indian manufacturing through appropriate policy support.

e. Ensure sustainability of growth, particularly with regard to the environment.

f. The National Manufacturing Plan must have three components:

   i. Special focus on some sectors of manufacturing which will enable the country to more rapidly achieve its goals for manufacturing and strengthen the overall manufacturing sector. For each of these sectors a long term plan will be prepared by working groups with participation of the sectoral associations. The plans will describe strategies to bridge the gap between the goals for the sector and the current reality and a 'keep / stop / start' analysis of initiatives / schemes to implement those strategies. The priority sectors for India at this time are placed at Box-8.1. This list has been developed by the National Manufacturing Competitiveness Council (NMCC) through extensive consultations & with Planning Commission participation.

   ii. An identification of the constraints that cut across manufacturing sectors; implement policies to relieve these constraints; and build capabilities. The areas for action at this time in India are listed in Box-8.2. This analysis has been done by Planning Commission with inputs from NMCC, the Department of Industrial Policy and Promotion (DIPP) and industry associations.

   iii. Active attention to improving the processes of implementation. Consultations between policy-makers and producers are required within each of the policy-areas. Since many stakeholders are involved, and various ministries in

government too, a nodal agency must be accountable to coordinate the evolution of the policy in each area and to manage its progress within the overall Plan.

Box–8.1

Priority Sectors

1. Sectors that will create large employment
   - Textiles and Garments
   - Leather and Footwear
   - Gems and Jewellery
   - Food Processing Industries
   - Handlooms & Handicrafts
2. 2. Sectors that will deepen technology capabilities in Manufacturing
   - Machine tools
   - IT Hardware and Electronics
3. Sectors that will provide Strategic Security
   - Telecommunication equipment
   - Aerospace
   - Shipping
   - Defence Equipment
4. Manufacturing-Technology sectors for Energy Security
   - Solar Energy
   - Clean Coal Technologies
   - Nuclear power generation
5. Capital equipment for India's Infrastructure Growth
   - Heavy electrical equipment
   - Heavy transport, earth moving and mining equipment

6. Sectors where India has competitive advantage
   - Automotive Sector
   - Pharmaceuticals and Medical Equipment
7. MSME sector—the base for the Manufacturing Sector—employment and enterprise generation

8.17 Considering the urgency with which Manufacturing must grow to meet national objectives, the process of developing the National Manufacturing Plan, with the participation of many ministries and industry associations, has already begun along these lines.

Box–8.2

Overcoming Constraints and Building Capabilities

1. Clustering/Aggregation:
   - Relieve infrastructure constraints
   - Strengthen industry-university linkages
   - Large, green-field industry-urban conglomeration: SEZs, Mumbai-Delhi Rail Corridor, NMIZs
2. Business Regulatory Framework
   - Competition Policy
   - Regulatory Infrastructure
   - Business Responsibility for Environment and Society
3. Human Resource Management
   - Skill Development
   - Industrial Relations—Fairness/Flexibility
   - Manufacturing Managers
4. Strengthen Technology
   - R&D
   - IPR policies
   - Trade and fiscal measures

- Standards

5. Reform role of PSEs
   - Focus on R&D
   - High capital/high risk areas
   - Professional management
6. Boost Exports
   - Reducing administrative costs
   - Branding/marketing
   - Logistics
7. Land and Water
   - Governance
   - Stakeholder consultation processes
   - Rehabilitation and Compensation policies
8. Energy Availability and Environmental Sustainability
   - Efficiency
   - Emissions
   - Renewables/Recycling: “Green Manufacturing”
9. Enabling Institutions for MSMEs
   - Access to capital and credit
   - Technology and productivity
   - Marketing and production inputs
   - Clusters

9

Health

9.1 The Eleventh Plan noted that although the percentage of total expenditure on health in India as a percentage of GDP was around 5 per cent, (which is roughly comparable to other developing countries), there was a disproportionally high reliance on private, particularly household's out of pocket, expenditure. This reflected a critical imbalance in the healthcare system, which stemmed from deficiencies in the public sector's capacity to deliver basic healthcare. The private sector too was characterised by wide variations. At one end of the spectrum were private hospitals with world class facilities and personnel offering services, which were competitively priced compared to similar services abroad, but remained beyond the capacity of most Indians. At the other end, there was an unregulated private sector which was more affordable, but offered services of varying quality, often by under-qualified practitioners.

9.2 The Eleventh Plan sought to correct this imbalance by raising the share of Public Expenditure on Health (both Plan and non-Plan) in the Centre and States taken together from less than 1 per cent of GDP in 2006-07 to 2 per cent to 3 per cent of GDP to be achieved over a period of time. The National Rural Health Mission launched in 2005 aimed at strengthening the healthcare infrastructure in rural areas, providing sub centres, primary health centres, community health centres, etc. The Plan also set seven measurable targets, reflecting the health status to be achieved by the end of the Plan period. These targets related to (i) Infant Mortality Rate (IMR), (ii) Maternal Mortality Ratio (MMR), (iii) Total Fertility Rate (TFR), (iv) under-nutrition among children, (v) anaemia among women and girls, vi) provision of clean drinking water for all (vii) raising child sex ratio for age group 0-6 years.

9.3 Data on health outcome achievements for the Eleventh Plan period are available only upto the year 2009. These data suggest that while there has been progress, it is less than what was targeted. Public health expenditure is likely to reach 1.4 per cent of GDP (and including drinking water & sanitation 1.8 per cent of GDP) by the end of Eleventh Plan. We should aim at raising total health expenditure to 2.5 per cent of GDP by the end of the Twelfth Plan.

Towards Comprehensive Health Care

9.4 To help define appropriate strategies for the Twelfth Plan, the Planning Commission constituted a High Level Expert Group on Universal Health Coverage under the Chairmanship of Prof. K Srinath Reddy. The High Level Expert Group is expected to submit its report before the finalisation of the Plan. Their recommendations will be an important input in defining a comprehensive health strategy for the next ten years.

9.5 While the Twelfth Plan must re-strategise to achieve faster progress towards the seven goals listed above, it must also define its health care strategy more broadly. The NRHM has focussed heavily on child birth and pre-natal care. It must however expand to a more comprehensive vision of health care, which includes service delivery for a much broader range of conditions, covering both preventive and curative services. The Twelfth Plan will prioritise convergence among all the existing National Health Programs under the NRHM umbrella, namely those for Mental Health, AIDS control, Deafness control, Care of the Elderly, Information, Education and Communication, Cancer Control, Tobacco Control, Cardio Vascular Diseases, Oral health, Fluorosis, Human Rabies control, Leptospirosis.

9.6 Other innovative management reforms within health delivery systems with a view to improve efficiency, effectiveness and accountability will be encouraged. The Tamil Nadu intervention of creating a separate public health cadre and maternal death audit will be promoted. Programmes/schemes will be evaluated on the basis of outcomes rather than outlays.

9.7 An accountability matrix will be devised in order to improve the seven health related goals articulated in the current Plan. The matrix will define the responsibilities of functionaries of the Health, Women and Child Development, and Water and Sanitation departments at the Block and habitation levels. Definite roles and accountabilities will also be assigned to Civil Society Organisations. Processes like real time data collection, community-based validation, and medical audits to ensure quality, cost-effectiveness and promptness of healthcare will be introduced.

9.8 While preventive health care is much cheaper than curative care, it has so far not received the attention it deserved. Existing frontline health educators and counsellors should play a lead role in compiling and disseminating preventive health practices to every nook and corner of the country. The state should play a lead role in building a culture of familiarity and knowledge around public health by involving Panchayati Raj Institutions (PRIs), Rogi Kalyan Samitis, Village Health, Sanitation and Nutrition Committees Urban Local Bodies (ULBs) and the available cadre of frontline health workers, through innovative use of folk and electronic media,

mobile telephony, multimedia tools and Community Service Centers. But most importantly, families and communities must be empowered to create an environment for healthy living.

9.9 The effectiveness of a healthcare system is also affected by the ability of the community itself to participate in designing and implementing delivery of services. The opportunity to design and manage such delivery provides empowerment to the community as well as better access, accountability and transparency. In essence, the healthcare delivery must be made more consultative and inclusive. This can be achieved through a three dimensional approach of (1) strengthening PRIs/ULBs through improved devolution and capacity building for better designing and management (2) increasing users' participation through institutionalised audits of health care service delivery for better accountability and (3) bi-annual evaluation of this process by empowered agencies of civil society organizations for greater transparency. Methodologies based on community based monitoring, which have proved successful in some parts of the country, will need to be introduced in other parts.

9.10 The Twelfth Plan must break the vicious cycle of multiple deprivations faced by girls and women because of gender discrimination and under-nutrition. This cycle is epitomised by continued deterioration in the sex ratio in the 0-6 year age group, revealed by the Census 2011; by high maternal and child mortality and morbidity, and by the fact that every third woman in India is undernourished (35.6 per cent have low Body Mass Index) and every second woman is anaemic (55.3 per cent). Ending gender based inequities, discrimination and violence faced by girls and women must be accorded the highest priority and these needs to be done in several ways such as achievement of optimal learning outcomes in primary education, interventions for reducing under- nutrition and anaemia in adolescent girls and providing maternity support. Also certain essential interventions outside the commonly understood 'area of health' need to be made, such as provision of sanitation facilities, including construction of toilets with water facility in schools, higher education opportunities and subsequent linkages to skill development. The effort to promote women's health cannot be without participation of men; hence, imaginative programs to draw men into taking part in their health seeking behaviour and practices must be devised.

9.11 The Twelfth Plan must make children an urgent priority. This will involve *convergence* of Health and Child Care services. At present, Health and Child Care services to 83 Crore Rural Indians residing across 14 lakh habitations, 6.4 lakh villages and 2.3 lakh Gram Panchayats are provided, rather independently, through a network of around 11 lakh Anganwadi Centres (AWCs) of the Women and Child Development Department and 1.47 lakh Sub-Centres of the Health Department.

9.12 Often, women attending AWCs with their children have to travel long distances to avail primary health care. While there is a case for expanding the network of AWCs to all habitations, even more urgent is the need to create a direct reporting relationship between AWCs and Sub-

Centres so that interventions are better synergized, resources are optimized, while women and children attending AWCs continue to get health and nutritional services under one roof. Here, it is also important to mention that there are groups within the SC and ST populations, like Primitive Tribal Groups and De-notified and Nomadic Tribes, as also internally displaced people, who continue to be under covered. We must consciously include them while making provisions for sub-centres and anganwadis.

9.13 The Twelfth Plan should aim at locating a Health Sub-Centre in every Panchayat and an AWC in every habitation their formal inter-linkage being a must for integrating the delivery of health, nutrition and pre-school education services. Through this approach, at least one ASHA would get positioned in each AWC; and at least one Auxiliary Nurse Midwife (ANM) / Health Worker (Female) would be available for a cluster of AWCs within every panchayat. Both could be brought under the oversight of the panchayat level health, nutrition and sanitation committee recently notified by the Ministry of Health and Family Welfare.

9.14 The health policy must focus on the special requirements of different groups, e.g., integrated geriatric health care and other needs specific to the elderly, 'adolescent friendly' health support services (and counselling) for victims of sexual or substance abuse, those infected with HIV/AIDS, those who are differently-abled, and those who belong to the lesbian, gay, bisexual, and transgendered (LGBT) community. Regional disparities must be addressed especially with respect to maternal health and child under nutrition in the 264 high focus districts of the NRHM. The high rate of growth of the population, particularly in certain states, must also be addressed. Mental health services, including psychosocial care and counselling, should be prioritized, in settings of transition due to migration, areas of conflict and disturbances, especially in the NER and J&K and in areas of natural disasters/calamities.

9.15 Available estimates of HIV/AIDS show that there were about 23.95 lakh people living with HIV/AIDS (PLHAs) in 2008-09 in India. Of these 38.7 per cent are women and 4.4 per cent children. Women who are not able to exercise control over their sexuality form a considerable proportion of those affected by HIV/AIDS. A positive feature is that the prevalence of the infection has stabilised and has marginally declined in some places. In keeping with the general focus on women in the Twelfth Plan, and the promise of making service delivery more community-centric, the plan shall encourage the use of frontline workers - AWWs, ASHAs, ANMs, and also women of the community, to provide comprehensive care for affected women, men and children. Special attention will be accorded to the needs of vulnerable groups like female sex workers, men having sex with men, and injection drug users. Infrastructure needs of high prevalence regions, especially the North East will be reviewed.

9.16 Other infectious diseases such as tuberculosis, malaria, also need focussed attention and a continued commitment to prevention and control. India also faces an escalating threat of non-communicable diseases like cardiovascular diseases, diabetes, cancers and chronic

respiratory diseases which are major killers, especially in middle age. We have to respond through a package of policy interventions including tobacco control, early detection and effective control of high blood pressure and diabetes and screening for common and treatable cancers. These strategies should be integrated into the NRHM and the NUHM (National Urban Health Mission). The Twelfth Plan should also encourage states to enact a Public Health Act, which enables proactive measures to avert threats to public health before an emergency occurs.

Health Infrastructure

9.17 One of the major reasons for the poor quality of health services is the lack of capital investment in health for prolonged period of time. The National Rural Health Mission had sought to strengthen the necessary infrastructure in terms of Sub-Centres, Primary Health Centres and Community Health Centres. While some of the gaps have been filled, much remains to be done. According to the Rural Health Statistics (RHS), 2010, there is shortage of 19,590 sub-centres; 4,252 PHCs and 2,115 CHCs in the country.

9.18 It is essential to complete the basic infrastructure needed for health delivery in rural areas by the end of the Twelfth Plan. This will require substantial Plan assistance to the states for infrastructural development including upgrading existing PHCs and CHCs to IPHS norms, building Labour rooms and Operation Theatres, which are critical to reducing Maternal mortality and also building new PHCs. Government diagnostic services will have to be strengthened at the block and district levels. This would require not only infrastructural upgrades but also adequate human resource support and well developed service delivery protocols. States also lack infrastructure for ancillary services like drug storage and warehousing, medical waste management, surveillance and cold chain management. Such facilities will have to be ensured at the District level.

9.19 District Hospitals need to be greatly strengthened in terms of both equipment and staffing for a wide range of secondary care services and also some tertiary level services. They should actually be viewed as District Knowledge Centres for training a broad array of health workers including nurses, mid-level health workers (e.g. Bachelor of Rural Health Care or Bachelor of Primary Health Practice) Paramedics and other public health and health management professionals. New medical and nursing colleges should preferably be linked to district hospitals in underserved states and districts, ensuring that districts with a population of 25 lakhs and above are prioritized for establishment of such colleges if they presently lack them. New programmes for developing mid-level health workers (such as Bachelor of Rural Health Care/Bachelor of Primary Health Practice) and nurse-practitioners which have been

introduced in some States must be similarly linked to District Hospitals and their attached District Knowledge Centres.

9.20 The network of expanded Sub-Centres, and fully functional PHCs and CHCs would be effective as a system only if prompt services for transportation of referred cases are available. The existing 1084 Mobile Medical units will be expanded to have a presence in each CHC. Mobile Medical Units may also be dedicated to certain areas which have a marked presence of moving populations. It will have to be ensured that each Mobile Medical Unit has requisite emergency equipment, drugs, basic diagnostics and a trained paramedic assigned to it. The possibility of transferring the Mobile Medical units to the Fire-Brigade department, as is the practice in many developed nations, will be explored.

9.21 While the National Rural Health Mission has taken up the task of providing health infrastructure in rural areas, there is no such public health care infrastructure at the urban level available to the common person. A major challenge in the Twelfth Plan is to ensure that all urban slums and settlements are covered with Sub Centres and ICDS centres (co-located where possible) and PHCs, through NUHM. This infrastructure cannot be based on mechanical application of population based norms since many people in urban areas have access to private medical care. However, after taking these factors into account, there is need for further expansion, especially in areas where lower income people reside. The Twelfth plan will innovate by creating local, low-cost treatment centres around relevant disease groups rather than generic ones, thus using resources more efficiently.

9.22 The Twelfth Plan must also aim at computerizing and interlinking all health facilities (Sub centres, Primary Health Centres, Community Health Centres, District hospitals, Referral Hospitals and Medical Colleges) and use IT/Mobile technology for creating new interfaces. IT can be used to create and sustain robust surveillance systems to remedy the present absence of accurate information on disease burdens as well as the frailty of early alert system for outbreak of infectious diseases. The Integrated Disease Surveillance System (ISDP) has not fully delivered and surveillance of non-communicable diseases has just started. The district health system must be strengthened and links established with non-governmental health care providers to develop a reliable and accurate reporting network for infectious diseases and risk factors of non-communicable diseases. Without such information, policy and programme planning will be enfeebled and impact evaluation will be difficult to undertake. Thus, there is a need to build a vibrant Health Information System for monitoring and evaluation.

9.23 Ensuring delivery of safe drugs is a major challenge. The Tamil Nadu Medical Services Corporation (TNMSC) provides a tested model for procurement and distribution to achieve economies of scale and use of monopsony power for procuring drugs at substantially marked down prices. The following may be done: a) Emphasis on local production of drugs, especially those that are relevant to the local disease burden. Public Sector Units (PSUs), which have

manufacturing capabilities, can play an important role in ensuring reasonably priced supply of essential drugs and they should be strengthened for this process, b) Making the prescription of unbranded generic medicines mandatory by state government and central government institutional doctors and mechanism to ensure its compliance by appropriate audit processes, and c) Availability of drugs to be ensured through expansion of the existing Jan Aushadhi Stores in all district, Sub-division and Block hospitals.

9.24 In the Twelfth Plan we must fund research into finding locally appropriate solutions to health issues. This would include studies to understand the uniqueness of disease epidemiology in the Indian population, development of effective and locally acceptable health practices, and scientifically validating best practices of Indian Systems of Medicine and Homoeopathy. Teaching in Medical Colleges should also be oriented to the unique needs of primary healthcare in the Indian population.

Human Resources for Health

9.25 Lack of human resources is as responsible for inadequate provision of health services as lack of physical infrastructure, especially in rural areas. According to Rural Health Statistics (RHS), 2,010, there is shortage of 2,433 doctors at PHCs (10.27 per cent of the required number); 11,361 specialists at CHCs (62.6 per cent of the required number); and 13,683 nurses at PHCs and CHCs combined (i.e., 24.69 per cent of the required number). In addition 7,655 Pharmacists and 14,225 Laboratory Technicians are needed at PHCs &CHCs (27.13 per cent and 50.42 per cent of the required number) in the country. These numbers are based on the 2001 Census.

9.26 The status of Human Resources for Health (HRH) has improved during the 11th Five year plan period, however much more needs to be done. The density of doctors in India is 0.6 per 1,000 and that of nurses and midwives is 1.30 per 1,000, representing jointly 1.9 health workers per 1,000. While no norms for Health Human Resource have been set for the country, if one takes a threshold of 2.5 health workers (including midwives, nurses, and doctors) per 1,000 population, there is shortage of health workers. Furthermore, because of a skewed distribution of all cadres of health workers, the vulnerable populations in rural, tribal and hilly areas continue to be extremely underserved.

9.27 The Twelfth Plan must therefore ensure a sizeable expansion in teaching institutions for doctors, nurses and paramedics. Only 193 districts of a total of 640 have a medical college – the remaining 447 districts do not have any medical colleges. Further, the existing teaching capacity for creating paramedical professionals is grossly inadequate. Against 335 medical colleges, there are 319 ANM training schools, 49 Health and Family Welfare Training Schools and only 34

LHV training schools. To fill the gap in training needs of paramedical professionals, the Twelfth Plan proposes to develop each of the District Hospitals (635) into knowledge centres, and CHCs (4535) into training institutions.

9.28 The ongoing initiatives for integrating AYUSH and capacity development of other traditional health care providers such as Registered Medical Practitioners (RMPs) and Traditional Birth Attendants (TBAs) must be strengthened. Positive traditional care practices and local remedies should be encouraged. Efforts will be made to improve the working conditions and remuneration of frontline workers- both contractual and regular- and build positive environments which will reduce their sense of isolation.

9.29 The shortage of personnel to serve in rural and remote areas has led to a tendency to fill vacancies through Plan schemes which allow appointments being made on a contractual basis. Contractual appointments account for almost half of the doctors in the public sector (RHS, 2010). However, this practice also leads to high rates of attrition of staff. CAG has pointed out that more than half of the contractual staff does not complete their entire tenure. Thus while the ability to appoint doctors on contractual basis gives much needed flexibility; it is not a substitute for developing sustainable health care capacities at the state level through regular personnel.

9.30 Even with the proposed levels of human resource training in district hospitals and CHCs, issues of regional equity, rural-urban distribution and quality would need special attention. In this regard, women from marginalized communities should be trained and hired to participate in the healthcare workforce. The strategy to enhance capabilities of these women in health, skill development, and access to sustainable employment will lead to their empowerment. Accordingly, scholarship and outreach schemes should be formulated to encourage them to train as nurses and paramedics.

9.31 Public health education must be developed as a multi-disciplinary, health system-connected, problem solving professional course and be open to both physicians and non-physicians. Expanding capacity of examination, certification and accreditation bodies is imperative. A start was made in the 11th Plan, but increased resources and a more evolved strategy is required to continue the work.

9.32 The XIIth will establish a Human Resource Health Management system for improved recruitment, retention and performance; rationalise pay, allowances and incentive structures; and create career tracks for competence-based professional advancement.

Publicly Financed Healthcare

9.33 Public financing of healthcare does not necessarily mean provision of the service by public providers. It is possible to have public financing while the service itself is provided by private sector players, subject to appropriate regulation and oversight. This type of partnership is common in many areas, but its scope has not been fully explored in the health sector. However, a number of experiments are now in operation which allow for private sector participation. At the Central level, the Rashtriya Swasthya Bima Yojana (RSBY) is a health insurance scheme available to the poor and other identified target groups where the Central Government and the State Governments share the premium in the 75: 25 ratio. RSBY covers more than 700 in-patient procedures with a cost of up to Rs. 30,000/-per annum for a nominal registration fee of Rs. 30/- Cashless coverage, absence of any bar based on pre-exisitinq conditions and age limit are other unique features of this scheme. A total of 2.4 crore families have been covered under RSBY and over 8600 health care providers are enrolled in the selected districts across 29 states and Union territories. In several Central Government hospitals, pathology and radiology services are outsourced to private providers. State Governments are also experimenting with various types of PPP arrangements which at times also include actual provision of healthcare by private practitioners. Public Private Partnership (PPP) as a mode to finance healthcare services, if properly regulated can be of use to the intended beneficiaries. However, care needs to be taken to ensure proper oversight and regulation including public scrutiny of PPP contracts in the social sector to ensure freedom from potential conflicts of interest and effective accountability.

9.34 As noted earlier, the burden of financing healthcare falls excessively on households in the form of out of pocket expenses. This burden can be lightened by expanding the supply of publicly financed healthcare services in primary, secondary and tertiary care. Ideally, this should be done through high quality, district level plans for health services provision, funded primarily by the states. These plans should become the basis for resource allocation and be made a public document to enable social audits of the progress made towards the goals.

9.35 The district plan must articulate a road map for providing assured universal preventive, promotive, curative and rehabilitative care needed for a population within the district itself- with only very few disease conditions requiring highly specialised care outside the districts. The financing of facilities within the districts must match the varying case loads and range of services being provided. It should act as a lever to ensure that every facility provides an externally certified minimum acceptable quality of care. Areas/districts which are more marginalised, or have greater problems of access, should receive a greater investment of human and financial resources.

9.36 Public financing of healthcare does not necessarily mean provision of the service by public providers. It is possible to have public financing while the service itself is provided by

private sector players, subject to appropriate regulation and oversight. This type of partnership is common in many areas, but its scope has not been fully explored in the health sector. However, a number of experiments are now in operation which allow for private sector participation. At the Central level, the Rashtriya Swasthya Bima Yojana (RSBY) is a health insurance scheme available to the poor and other identified target groups where the Central Government and the State Governments share the premium in the 75: 25 ratio. The service is provided on a cashless basis by accredited government and private sector hospitals, which are reimbursed on a predetermined basis. In several Central Government hospitals, pathology and radiology services are outsourced to private providers. State Governments are also experimenting with various types of PPP arrangements which at times also include actual provision of healthcare by private practitioners. Public Private Partnership (PPP) as a mode to finance healthcare services, if properly regulated can be of use to the intended beneficiaries. However, care needs to be taken to ensure proper oversight and regulation including public scrutiny of PPP contracts in the social sector to ensure freedom from potential conflicts of interest and effective accountability

9.37 Any social security system must aim at providing some basic Universal Health Care. The Twelfth Plan will explore the possibilities of introducing a government funded health insurance plan for every citizen along the lines of the RSBY, which is currently limited to the poor and for certain select groups. Insurance under the plan will focus on both preventive and curative services. The premiums should be contributed by the beneficiaries and their employers. Fiscal incentives could be devised to encourage employers and employees to contribute to such a health insurance scheme.

Child Nutrition and Restructuring ICDS

9.38 The ICDS is a 35 year old programme aimed at nutrition and pre-school education. It can play a major role in affecting nutrition and therefore health outcomes, though as presently conceived, it has flaws. It focusses mainly on children in the age group of 3 to 6 years who actually attend *anganwadis,* whereas the greatest need for nutritional support is in the age group of 0-3 years. The programme needs to be radically restructured to focus on reaching pregnant and lactating mothers, and also the more vulnerable children in the 0-3 age group. Restructuring should promote decentralisation of administration, and laying stress not only on expansion, but also on quality. Other proposals include ensuring greater flexibility in implementation, capacity development, ensuring greater community ownership with participation of women's/mothers groups, management reform and strengthening of convergence with related flagship and other programmes.

9.39 A major shift is needed towards family and community based interventions, like a strong emphasis on breastfeeding in particular. The ICDS should be seen as the critical link between children and women and the health care systems, as well as with the elementary education system, and ensure that focus is brought on children in the critical window of 0-3 years of age. One initiative should be the effective linking of AWCs with Health Sub-Centres as well as with drinking water and sanitation services.

9.40 On the direction given by Prime Minister's National Council on India's Nutritional Challenges, an Inter-Ministerial Working Group on ICDS Restructuring has been set to draft a comprehensive ICDS restructuring proposal.

9.41 There is no national system of nutrition monitoring, mapping and surveillance in the country. District level disaggregated data is not available from existing surveys. DLHS remains inadequate in its coverage. There is a need to generate reliable District level disaggregated data so that we are able to monitor the progress made on under-nutrition. An innovative health and nutrition monitoring and surveillance system should be put in place. It can be used as a major enabler for performance management including financial management through real time data flow to the health system and for the restructured ICDS. It should have a vibrant community based monitoring component, which will function in partnership with civil society organisations, women/community groups and Panchayati Raj Institutions. The development of an e-health database with health-ID cards capturing complete digital histories will be planned.

9.42 The Twelfth Plan provides an opportunity of bringing together the world’s largest health and child care systems through flexible frameworks that ensure a continuum of care with normative standards, while responding to local needs at village and habitation levels. Convergent action over the next plan period will translate this vision into programmes that will touch the lives of all citizens, meet their expectations and also fulfilling their rights – particularly the rights of women and children in the communities, where they live and grow.

10

Education & Skill Development

10.1 Education is the single most important instrument for social and economic transformation. A well educated population, adequately equipped with knowledge and skill is not only essential to support economic growth but is also a precondition for growth to be inclusive since it is only the educated and skilled person who can stand to benefit most from the employment opportunities which growth will provide.

10.2 The Twelfth Plan must pick up the challenge of ensuring that all children including differently-abled children are able to enjoy equal access to education and educational institutions. A concerted effort is needed to strengthen the system at all levels: elementary education, secondary and higher secondary education and higher education. In parallel, vocational education and skill development efforts need to be strengthened.

Universal Elementary Education (UEE)

10.3 Sarva Shiksha Abhiyan (SSA) since its inception in 2001/2002 as the main vehicle for providing elementary education to all children in the 6-14 years age-group has made considerable progress in universalization of elementary education (UEE). However, with the Right to Education (RTE) Act, 2009 having come into effect from April 2010, it is now a fundamental right of all children to demand eight years of quality elementary education. Effective enforcement of this right requires that the mandate under the RTE is aligned with the vision, strategies and norms of the SSA. To achieve UEE in a planned and time bound manner, a much higher level of funding and also better targeting of uncovered and under-covered population will be necessary. Isolated habitations, educationally backward blocks and districts shall require special attention. Flexible approach and concerted efforts are needed to reach out to the Out of School Children (OoSC) including children with special needs and street children. Bridging the social and gender gaps in enrolment with regard to SC, STs and minority girls would receive special attention. Given the fact that several States face serious limitations of funds in implementation of the RTE, innovative ways would have to be found to address resource constraints.

10.4 Despite improvements in access and retention, the learning outcomes for a majority of children continue to be an area of serious concern. Several studies suggest that nearly half the children in Grade 5 are unable to read a Grade 2 text. Concerted efforts are required to ensure that a minimum set of cognitive skills are acquired by all children during eight years of elementary education. Thus, quality issues and determinants thereof such as ensuring availability of trained teachers, good curriculum and innovative pedagogy that impact upon learning outcomes of the children must be addressed on priority basis. Quality as mandated under the RTE shall have to be realised in tangible terms, failing which it will be difficult to wean students away from private tuitions that are prohibited under the RTE. Teacher absenteeism and lack of accountability has to be addressed by greater community involvement in management and ownership of schools. We have to find ways to incentivise the States for community involvement in school management so that management control shifts to the local community. Decentralized recruitment of qualified teachers would ensure their accountability to local authorities since the local community is best placed to exert pressure for superior quality outcomes.

10.5 The effort to expand educational access is severely constrained by the lack of suitably-qualified, appropriately-trained human resources in adequate numbers. There are half a million vacancies of teachers in the country and another half a million teachers are required to meet the RTE norms on pupil-teacher ratio. Besides 0.6 million teachers in the public school system are untrained. Pre-service and in-service training of teachers has to be mounted on a mission mode during the Twelfth Plan for which information and communication technologies could be effectively leveraged. Apart from expansion, the regulatory framework for teacher education and training requires complete overhaul. There is acute shortage of high quality teachers. We must build effective organic linkages of teacher education with higher education to bring school teachers closer to sources of knowledge generation. Efforts in this direction would also focus on research in curricular and pedagogic practices and address the paucity of teacher educators. The content and pedagogy of teacher education should be aligned with the National Curriculum Framework (NCF) for Teacher Education adopted in 2009, which *inter alia*, recommends for a shift to a four-year integrated degree programme of teacher education. Teacher training institutions should be rated so as to improve their quality and testing services may be instituted to assess and grade competency and proficiency of teachers. All this could form part of a National Mission on Teacher Education within the framework of RTE Act.

10.6 In the Twelfth Plan, possibilities will have to be explored for involving private sector more meaningfully to achieve the objective of expansion and quality improvement. Recognising the importance of private schools, the RTE Act mandates that all schools, whether they receive

financial aid from the government or not, must reserve 25 per cent seats for children from disadvantaged households. However, barriers to private entry are high which need to be re-examined. Problem of private tuitions has to be addressed pragmatically. Implementation of the RTE would have to be monitored in terms of learning outcomes.

10.7 Mid-Day Meal Scheme (MDMS) that now covers students at the elementary stage in all government, local body and aided schools, has made remarkable progress but a few weaknesses noted in its implementation need to be addressed. While expanding the coverage of MDMS, fiscal incentives like tax exemptions may perhaps, be considered to encourage private participation in the scheme. A system needs to be put in place to see that poor children are admitted in neighbourhood private schools against the 25 per cent earmarked seats under RTE and are not deprived of the MDMS.

10.8 In addition to the above, several other measures are required to enhance provision and improve quality of elementary education. These would include -

- Integration of pre-school education into schooling especially in the Government schools so as to provide entitlements at the pre-school level.
- Funding for pre-school children under Early Childhood Care and Education (ECCE), especially in special focus districts.
- Making physical education, games & sports an integral part of curriculum in schools for holistic development of children and making provision of infrastructure for the same.
- Stepping up provision of infrastructure through convergence with schemes like MGNREGA for which MGNREGA norms may be revisited.
- Strengthening of monitoring and evaluation mechanism including social audit for SSA and MDMS with web-based monitoring for transparency and periodic and sustained third party evaluation.
- Promoting Adult Literacy with Sakshar Mission as the main vehicle with focus on women, SC/ST and minorities covering all Educationally Backward Block (EBBS).

Expansion of Secondary Schooling

10.9 The Gross Enrollment Ratio (GER) at the secondary school stage (Classes IX–X) is currently around 60 percent which is woefully low. With UEE becoming a reality, near universalization of secondary education is a logical next step. Anticipating this, the scheme of *Rashtriya Madhyamik Shiksha Abhiyan* (RMSA) and the Scheme of Model schools were launched in the Eleventh Plan to improve enrolment and quality in secondary education. It now appears desirable that efforts in this direction are expedited and RMSA is made a single

comprehensive scheme to address issues of coverage and quality in secondary education in a holistic manner. Gradually, the scheme shall have to be extended to the higher secondary stage and cover aided schools as well. This would require that several small schemes like Inclusive Education for Disabled at Secondary Stage, ICT, and Girls' Hostel are merged with RMSA. Girls' education particularly, in special focus areas could be further incentivised and innovations in school education promoted with untied funds.

10.10 While stepping up public investment in the sector by the Central and State Governments would be necessary, it is imperative that the private sector capabilities are fruitfully tapped particularly as a majority of our secondary schools, including aided schools, are under private management. Models for PPP in this sector also need to be vigorously explored.

10.11 The Centrally funded *Kendriya Vidyalayas* (KVs) and *Navodaya Vidyalayas* (NVs) have emerged as premier public educational institutions in secondary education and need to be expanded substantially. Further, the existing 1060 KVs and 576 NVs could become hubs for inter-school activities so as to catalyse improvement in other publicly funded schools in the area. This may be particularly important in promoting science and mathematics education, organizing joint school seminars and educational exhibitions and running bridge courses in English. Similarly, better-endowed and well-functioning schools under the State governments and the private schools could also become hubs for galvanising inter-school activities.

10.12 It is a common knowledge that children acquire skills faster if taught earlier. It may, therefore, be important to offer pre-vocational courses in Class IX and X either as an add-on or as an alternative to work education or third language, where applicable. Students opting for such pre-vocational courses could be encouraged and facilitated to take up advanced vocational subjects at the higher secondary level. Providing vertical mobility options for students opting for vocational courses, to pursue undergraduate and postgraduate level, if they so desire, appears imminent, failing which the vocational courses at the school-level may not pick up. For a high quality vocational education at school level to evolve and grow in the country, there is a need to train and equip our teachers on a continuous basis with latest skills and the vocational pedagogy itself. A National Vocational Education Qualification Framework (NVEQF) has to be put in place to ensure mobility. The vocational curriculum needs to be integrated and closely aligned with academic curriculum containing modules on various generic and specific vocational skills and that the same need to be evolved in consultation and active involvement of industry. Revised scheme of vocationalization of secondary education may be further revisited so as to ensure that it is aligned with the new qualification framework and industry-led sector skill councils. There is a need for special focus on training of trainers/teachers in skill impartation possibly using a PPP model.

10.13 According to the Census 2011, overall literacy rate has increased from 64.8 per cent in 2001 to 74% in 2011. Improvement in female literacy has been more rapid than male literacy and the gender gap has declined to 16.7 percentage points in 2011 from 21.6 percentage points in 2001. The mean years of schooling of the working age population (over 15 years) has increased from 4.2 years in 2000 to 5.12 years in 2010. However this remains well below the level in other emerging market countries such as China (8.17 years), and Brazil (7.54 years). Fortunately, the efforts made in expanding access to education in the past ten years will show up in the form of younger, more educated population entering the labour force replacing the retiring / superannuating older and less-educated individuals. There is a good chance that we can reach an average of 8 years by the end of the 13th Plan.

Skill Development

10.14 Improved training and skill development is critical for providing decent employment opportunities to the growing youth population and necessary to sustain the high growth momentum. Although institutional structure has been put in place, there is still a long way to go. While skill formation has to be mainstreamed in the formal education system right from class X onwards, skill creation outside the formal education needs coordinated action and innovative approach. National Skill Development Mission launched in the Eleventh Plan has brought about a paradigm shift in handling skill development programmes, has clearly defined core principles and put in place a Coordinated Action Plan for Skill Development. A three-tier institutional structure is already in place for the purpose. This lays down a solid foundation for a skills ecosystem in the country. During the Twelfth Plan, gaps in skills eco-system have to be identified and plugged, while building on the foundation that has been laid. An important tier of the Coordinated Action Plan for Skill Development, National Skill Development Corporation (NSDC) has already made significant progress and bulk of such skill formation targeted particularly at the large unorganized sector will come through NSDC interventions and initiatives at the State level. For this, support to NSDC would have to be significantly enhanced and State Skill Development Missions in all States would have to be fully operational and effective during the Twelfth Plan.

10.15 There is a need for concerted action in several key areas in order to ensure that skill formation takes place in a demand driven manner. Curriculum for skill development has to be reoriented on a continuing basis to meet the demands of the employers/industry and align it with the available self-employment opportunities. Accreditation and certification system has to be improved. There is a need to establish an institutional mechanism for providing access to information on skill inventory and skill maps on a real time basis. A sectoral approach is required for the purpose with special emphasis on those sectors that have high employment

potential. Standards may be set by the industry-led sector skill councils which must be made effective during the Twelfth Plan, while the accreditation of certification processes should be done by independent, specialised agencies with certification left to the institutions. Skill Development Centres can be established in existing education and training institutions. This would ensure huge saving in cost and time. A system of funding poor people for skill development through direct financial aid or loan also needs to be put in place. Apprenticeship training as another mode for on-job training has to be remodelled to make it more effective and up-scaled significantly.

10.16 Finally vocational education at the school level and vocational training through Industrial Training Institutes (ITIs) and Industrial Training Centres (ITCs) need significant expansion and overhaul. There is an urgent need to revisit the scheme for upgradation of governments ITIs as Centres of Excellence through the PPP to implement it more effectively during the Twelfth Plan. . There is a need for establishing flexible learning pathways integrated to schooling on one end and higher education on the other through National Vocational Education Qualification Framework (NVEQF). Public-Private Partnerships in financing, service delivery, and provision of workspaces and training of trainers should be promoted. Employment exchanges can be repositioned as outreach points. There is a need for removal of entry-barriers to private participation, while putting in place an effective regulatory framework for monitoring, evaluating and analysing outcomes of various programmes. All these issues have received thoughtful consideration during the Eleventh Plan; now operational details have to be worked out and specific initiatives launched during the Twelfth Plan.

10.17 We should aim to increase the percentage of the workforce which has received formal skills through vocational education and training from 12 percent at present to 25 percent by the end of the Twelfth Plan. This would mean that about 70 million more people have to be imparted formal skills in the next five years.

Higher Education

10.18 Growing youth aspirations and massive expansion of schooling is creating a huge demand for higher education. Higher education is also essential to build a workforce capable of underpinning a modern, competitive economy. As a consequence, enrolment in higher education would have to be significantly increased in a demand driven manner during the Twelfth Plan. The process of broadening access, making higher education inclusive, and promoting excellence initiated during the Eleventh Plan must be consolidated and expanded further during the Twelfth Plan. The push for excellence is especially challenging because excellence is not achieved by mere provision of resources alone. Some of the initiatives needed to achieve excellence are discussed in para 10.27 to 10.32 below.

10.19 Several reforms in the regulatory framework are currently underway such as, a proper accreditation structure, quick redressal of disputes through educational tribunals and prevention of malpractices and establishment of a national level apex body, that is, National Commission on Higher Education and Research (NCHER) to ensure autonomy of institutions and enhancement of standards and provision for entry of foreign education providers. These reforms would have to be coached within the emerging architecture of global higher education, carefully blending external policy feedback with the country's own endogenous policy traditions. Once these reforms are in place, it is expected that some of the endemic problems of this sector would be resolved. However the crucial issue of making the large investments required in higher education would have to be addressed squarely by mobilizing resources from Government and also from private sources. In addition, specific actions in several key areas are required on priority basis through a comprehensive plan as outlined below.

Shift of Focus to Quality

10.20 There must be a strategic shift from mere expansion to improvement in quality higher education. For this, the focus should be not only on larger enrolment, but also on the quality of the expansion. During the Twelfth-Plan period, an additional enrolment of 10 million could be targeted in higher education equivalent to 3 million additional seats for each age cohort entering the higher education system. This would significantly increase the GER bringing it broadly in line with the global average.

10.21 A holistic and balanced expansion approach is needed to target under-represented sections of society. Thrust should be on consolidating and improving the capacity and quality of the existing institutions. New institutions may be set up to bridge regional imbalances and disparities across disciplines and to address special economic, social and technological needs of the country. Further, traditional education should be supplemented with skill-based studies and institutional differentiation should be encouraged so that institutions grow along their own growth trajectories without being clones of each other. Open and distance education methods could be deployed to augment capacity optimally. In addition, the concept of Meta University aimed at collaborative and multi-disciplinary learning that redefines knowledge-creation and knowledge-sharing in the twenty-first century, could also be explored.

More Resources and Better Utilisation

10.22 There is an urgent need to step up both public and private investment in higher education (including technical), and increase in the efficiency of its utilization. About 18 per cent of all government education spending or about 1.12 percentage of GDP is spent on higher education today. This should be raised to 25 percent and 1.5 per cent respectively. An increase

of 0.38 per cent of GDP means an additional allocation of about Rs.25, 000 crore to higher education for the Centre and the States taken together.

10.23 State universities and their affiliated colleges that account for more than 90 percent of the enrolment suffer from severe fund constraints and poor governance leading to poor quality. Strategic Central-funding based on State higher education plans should be leveraged to stimulate more state funding linked to academic and governance reforms which may include norm-based funding for State universities and colleges. Allocation of operating budget should be based on objective norms and new investments based on competitive grants and performance contracts. Institutions should be encouraged to raise their own funds through various legitimate means. Reasonable tuition fees in higher education need to be supplemented with appropriate publicly-funded financial aid. The scale and reach of scholarship schemes and student loans need to be enhanced. Government guarantees for student loans could be considered. The central principle should be that no student who is eligible to be admitted should be deprived of higher education for financial reasons.

Enhancing Employability

10.24 There is a need for a clear focus on improving the employability of graduates. Indian higher education is organized into 'General' and 'Professional' streams. General education which is an excellent foundation for successful knowledge based careers, often fails to equip graduates with necessary work skills due to its poor quality. On the other hand, professional education is often expensive, lengthy and usually imparted in narrowly specialized private institutions, with little emphasis on liberal arts, which is essential for the development of intelligent able-minded citizens. For both 'General' and 'Professional' education streams, integrated curriculum with greater flexibility in choice of subjects and innovative pedagogic practices are needed to improve the quality and hence employability. Graduates now require the skills beyond the basics of reading writing and arithmetic (the '3Rs'). Skills such as critical thinking, communication, collaboration and creativity (the '4Cs') are now important in more and more jobs. Accordingly, there is need to focus on the '4Cs'. Special emphasis on verbal and written communication skills, especially in English would go a long way in improving the employability of the large and growing mass of disempowered youth.

10.25 The Vocational Education and Training sector in the country is small and this limited capacity is under-utilized due to poor quality and lack of social status. During the Twelfth-Plan, there is an urgent need to develop a large sector offering short-cycle qualifications in the form of associate degrees catering to intermediate skills in the higher education space within the National Vocational Education Qualifications Framework. Such degrees would carry with them

Encouraging Private Participation

10.26 Private sector growth in higher education (including technical) should be facilitated and innovative Public-Private Partnerships (PPP) should be explored and developed in the Twelfth-Plan. Private higher education accounts for about four-fifths of enrolment in professional higher education and one-third overall. This growth trend is likely to continue in the Twelfth Plan. Currently, this growth is restricted to specific areas and there are concerns about quality and use of unfair practices. A clear policy is therefore required to manage private education and a statutory and transparent framework needs to be established for its operation for driving private growth further in a legitimate and balanced manner. The "not-for-profit" tag in higher education sector should, perhaps, be re-examined in a more pragmatic manner so as to ensure quality without losing focus on expansion and equity. Deserving private institutions could benefit with access to public funds in the form of loans, financial aid for students and competitive funding for research.

Research Culture and Faculty Issues

10.27 We must bring back the 'lost' research culture of Indian Universities so as to create new knowledge and improve teaching standards. This would require more funding for university-based research and funding policies that create right incentives for quality research and promote collaboration among institutions. Related to this is the issue of faculty shortages which can be tackled through innovative ways such as technology-enabled learning and collaborative information and communication technologies (ICT). A complete overhaul of the Academic Staff Colleges that are used to provide refresher courses for teachers is also necessary. Initiatives to improve the quality and availability of teachers in higher education need to be launched in a mission mode. With improvements in life expectancy, a growing pool of retired and elderly people is now available in the country. They have potential to enrich teaching-learning experience and act as social capital for the society. It is possible to tap and convert their valuable acquired expertise into useful codified knowledge through a special Ph.D. programme for senior citizens facilitated by liberal entry requirements.

Other Initiatives

10.28 Several other measures are needed to improve quality and promote excellence in higher education. Accreditation should be at the core of regulatory arrangements and must have clear incentives and consequences. This would require multiple strong and independent accreditation bodies. Governance system needs to be revamped by balancing institutional autonomy with accountability and developing institutional leaders. Full implementation of examination reforms, choice-based credit and semester system must be ensured to enhance flexibility and provide greater choice. The affiliated college system should be improved by deploying advanced technology and restructured so that a reasonable number of colleges are affiliated to each university and a 'hub and spoke model' established to foster curricular and pedagogic reforms. In recent years, higher education has isolated itself from the society resulting in breakdown of this vital social contract. There is a need to launch a campaign to re-establish and strengthen higher education's close linkages with the society through a well-coordinated approach going way beyond the prevailing National Service Scheme (NSS). Universities and colleges should be encouraged to engage more intensively than before with wider society and contribute to the local and regional development and provide intellectual leadership to society.

10.29 Information and Communication Technologies (ICTs) should be harnessed to enrich teaching-learning experience, to extend and diversify delivery, improve research quality and collaboration by making knowledge and information widely available, and ensure effective governance both at the institutional and systemic level. Student services needs to be significantly improved and admissions should be streamlined.

10.30 While most of our universities and colleges are required to build human resources to reach desired levels of competence, we also need to go beyond this to ensure that the country has several institutions of higher education that strive to achieve excellence in both teaching and research. The latter needs significantly large resources and, also much greater institutional autonomy and approval incentive structures. Realistically, India should aim to have at least a few universities in the global top-league. To achieve this as quickly as possible, the country should act on two fronts. It should create new top-end universities and also upgrade very good ones. A few new Innovation Universities could be established urgently, and several universities and institutions could be converted or upgraded by creating centres of excellence within the University, building on their existing strength. At the core of achieving excellence, is ability of institutions to attract and retain high quality faculty from across the world. This not only requires providing them with competitive salaries but also ensuring a challenging work environment and a lot of flexibility. The Twelfth Plan should attempt to operationalize these objectives.

10.31 In addition, the idea of creating large education hubs on fallow lands at four or five locations in the country, anchored by large public sector enterprises (possibly with participation by the private sector) and funded through their allocations for corporate social responsibility needs to be explored. These could be models for industry-institute interface and would ensure local and regional development of areas where these are located.

10.32 Higher education is an increasingly global enterprise; hence Indian institutions should embrace internationalization that could provide them with new opportunities. Country's rationale for internationalization would be to enhance its soft power, improve standards of domestic provision and produce graduates with international competencies and skills. This can best be achieved by having more and innovative partnerships. Given the historical advantage in higher education (particularly among emerging market economies) the wide spread use of English language and low cost living, India can potently become a global hub for higher education. We need to provide greater autonomy to our Centres of excellence to enter into collaborative partnership with the best universities abroad.

10.33 In sum, with new regulatory arrangements and focused action in key areas, particularly expansion and quality improvement, we hope to build a robust higher education system that would sustain rapid economic growth, promote international competitiveness, while at the same time meet the rising expectations of the young Indians.

11

Social and Regional Equity

11.1 As pointed out in Chapter 1, the acceleration of growth in recent years has been accompanied by efforts at greater inclusiveness which has had resonance in many of the slower growing States. However, within this framework of acceleration, despite efforts to be inclusive, there are concerns whether historically disadvantaged groups have benefited adequately and also whether some regions are still neglected. The Twelfth Plan needs to pro-actively address these concerns.

Social Equity

11.2 Planning has traditionally focused on the need to provide special support to historically disadvantaged groups. The Scheduled Castes (SC) and Scheduled Tribes (ST), have a special status under the Constitution. Some other disadvantaged groups needing special support are Other Backward Classes (OBC), Minorities, De-notified Tribes, Semi- Nomadic and Nomadic Tribes, Primitive Tribal Groups, Differently Abled Persons, Widows, Senior Citizens, Internally Displaced Persons, People Living with HIV AIDS, Victims of Alcoholism and Substance Abuse etc.

11.3 Several steps have been taken over the years to bridge the gap between the SCs/STs and the rest of the population. These include reservation in educational institutions and government employment. Today there is some progress in improving the position of SCs, STs and OBCs in school enrollment, and in parameters such as literacy and the percentage of people below the poverty line. But gaps still persist, and further efforts are needed. Scholarship schemes for Scheduled Castes (SCs), Scheduled Tribes (STs), Other Backward Classes (OBCs) and Minorities have enabled many students from these sections to continue their education. Greater effort is needed, however, to improve enrolment ratios and to reduce drop rates especially for girl children among SCs, STs, OBCs, and Minorities.

11.4 An important initiative in closing the gap between the SCs/STs and the rest is the concept of Special Component Plan, consisting of the Scheduled Castes Sub-Plan and the Tribal Sub-Plan. This strategy purports to direct plan resources towards meeting their needs in proportion to their share in the total population. Its implementation, however, has been deficient both in the States, and the Centre. A new system must be devised for the Twelfth Plan which can overcome the difficulties experienced in the past and ensure that the sub-Plans are implemented in letter and spirit.

11.5 De-notified, nomadic and semi-nomadic tribal communities and the internally displaced people (IDP's) have been deprived of developmental benefits, as there is no exclusive development programme designed for them. Efforts will, therefore, be made to devise, in consultation with them, suitable development programmes in the 12th Five Year Plan.

11.6 Among Scheduled Tribes there are 75 Particularly Vulnerable Tribal Groups (PTGs). They demand special and immediate attention as they suffer on many counts including lack of proper health care. A plan of action needs to be put into place for their survival, protection and development.

11.7 Multi-Sectoral Development Programme (MSDP) in 90 Minority concentration districts was launched over the last Plan period. Its effective implementation over the 12th Five Year Plan is essential for ensuring minorities' development.

11.8 Manual scavengers are the most severely disadvantaged among these groups. The Government had committed to eradicate this heinous practice and provide them sustainable rehabilitation by the end of the 11th Five Year Plan. This unfulfilled commitment needs to become priority for fulfillment during the 12th Five Year Plan.

11.9 Though 'Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act' has been in force since 1995, large numbers of differently abled persons continue to exist at the margins of society. The Twelfth Five Year Plan must initiate special action in consultation with these people in both urban and rural areas to ensure that their concerns are adequately met.

11.10 With increasing life expectancy, the numbers of Senior Citizens is growing. All seniors, particularly the indigent need health care, security and integration with the rest of the society.

This is being envisioned in the new National Policy for Older Persons, which is under preparation.

Backward, Border and Remote Areas

11.11 Special emphasis must be given in the XIIth Plan for connecting to areas where connectivity is poor, which is one of several reasons why they are unable to become active participants in the growth process. These areas include the mountainous Himalayan region, the under-developed pockets in Central and Eastern India, the islands territories and some regions in the North East. A large number of districts (often characterised by forested areas with tribal population) in the States of Andhra Pradesh, Orissa, Chattisgarh, Maharashtra, Jharkhand, Bihar, Madhya Pradesh and Uttar Pradesh have experienced much less development than the overall development of the States within which they are located. They are also affected by Left Wing Extremism. Some of these less developed regions are spread across state boundaries, such as Bundelkand, which extends across Uttar Pradesh and Madhya Pradesh. In other instances these are pockets within a state that are historically fraught with difficult conditions. Notable amongst them are the Vidharbha region of Maharashtra; the Kalahandi, Bolangir and Koraput (KBK) region in Orissa and most of the tribal belt in Central and Eastern India.

11.12 To deal with the legitimate aspirations of the people of these neglected regions the overall growth strategy must have a component of regional development. This will require inter-state cooperation and strengthening the pace of development of inter-state and intra-state connectivity of tribal and other isolated communities through forests and difficult terrain. It will need better governance and deeper involvement of local people in the development process. Skill development and employment opportunities must be an important component of this strategy. The XIIth Plan will identify such areas for continued and enhanced development.

11.13 The development of physical infrastructure coupled with opportunities for education and skill development can generate significant improvements in livelihood and incomes and result in better sharing of the fruits of economic growth with these remote areas.

Plan within a Plan

11.14 A special effort is needed in the Twelfth Plan to create a Plan within a Plan. There are already programmes such as the Backward Regions Grant Fund (BRGF), Border Area Development Programme (BADP), Hill Area Development Programme (HADP), the Kalahandi, Bolangir and Koraput (KBK) Plan, the Bihar Special Plan, the Bundelkhand Special Package, and most recently, the Integrated Action Plan (IAP) for Left Wing Extremism (LWE) affected districts. The XIIth Plan should create a greater coherence among all these Special Plans.

11.15 This objective will be served by identifying suitable programmes for the following categories which can then be developed into an integrated programme for the concerned region:

- Neglected rain-fed regions whose significance and untapped potential to contribute to agricultural growth has been outlined in the chapter on the farm sector.
- The Central Indian tribal belt, which is vulnerable to Maoist activities
- Remote and isolated areas such as those in the Himalayan and border regions
- Remote tribes and isolated ethnic groups who suffer from economic and educational backwardness
- The poorest sections of the population in terms of income/consumption. These include Women and Children Headed Households.

11.16 A major problem with implementing new development initiatives in specially disadvantaged areas is that these areas also have weak administration capacity and poorly functioning institutions of governance. They also lack local empowerment. There is a case for creating a special arrangement whereby in the first two years of the Twelfth Plan funds can be unconditionally released for all these districts to facilitate the following:

- Capacity building of PRIs, in terms of both human resources capacities and systems of implementation.
- Improved implementation of flagship programmes.
- Speedy implementation of PESA.
- Speedy implementation of FRA.

11.17 This strategy would improve the absorptive capacities of these districts for outlays provided under various schemes and also for the use of additional funds which will be provided to those districts that are able to move in the direction specified in the first two years of the Plan. Progress could be monitored against the list of indicators developed by the Planning Commission and additional funds in the next three years would be given only to those districts which show progress against these indicators.

11.18 The funds provided for the last three years of the Twelfth Plan through this BRGF window for these central Indian tribal districts should be spent on programmes to be developed within each district in a 'bottom-up' and participatory manner. The Centre will not specify anything beyond this about the heads on which this money should be spent, so long as the districts adhere to this decentralised process of formulating the programmes. Consideration

needs to be given to make the focus of the Plan on blocks of tribal concentration, because the tribal central India is imbued with demography of sparse settlements within enclaves of concentration in the district. It is such tribal blocks that need special attention.

11.19 A similar architecture of implementation could be visualised for the other special regions and categories mentioned above.

The North East

11.20 The North Eastern region has special challenges which need special application of mind. It has enormous development potential, but its growth has been slow. Development of infrastructure, better connectivity, greatly improved access to trade with the rest of the country and 'Look East' window to Bangladesh and South East Asia will yield rich results. The low levels of private investments in the region are due to the perception of limited opportunity and difficult logistics and access. These are complex and sensitive issues for which imaginative solutions must be found during the XIIth Plan.

11.21 There is good potential for development of hydro power in Arunachal Pradesh, Sikkim and other States of the region. A regional growth strategy needs to be developed for this purpose. Evacuation of power from hydro plants which are being completed at different times will pose many challenges pertaining to environmental and peoples' concerns which need sensitive handling. Development of road infrastructure is critical for faster completion of many of these power projects because movement of heavy equipment to remote areas is not possible without an effective road linkage. Another important area is upgrading and expansion of the transmission grid in the region, so that it can both receive and transfer power to the rest of the country.

11.22 The "Look East Policy" should lead logically to special efforts at developing road connectivity to Thailand, Myanmar and Bangladesh. Such initiatives are imperative for developing border trade and economic activity in the region. There is need to develop policies which strengthen our mutual dependence with the neighbouring economies, particularly, Bangladesh. As we expand our power potential in the North East, we can transfer surplus power to Bangladesh.

11.23 There are other business opportunities within North Eastern States especially Assam, Tripura, Meghalaya, Mizoram, Manipur and Nagaland with Bangladesh and South East Asia. Development of waterways transport will also generate economic activity in the regions. Tourism is another high potential area which can be developed with new tourist circuits to showcase the culture, history and immense natural beauty of the area. Expansion of railways

and air landing strips can help development of a regional transport network which is essential for improving connectivity of the region.

12

Challenge of Urbanisation

Rising Urban Populations

12.1 In 2001, India's urban population, living in approximately 5,200 urban agglomerations, was about 285 million. It has increased to almost 400 million in 2011. Projections are that by 2030, out of a total population of 1.4 billion, over 600 million people may be living in urban areas. The process of urbanisation is a natural process associated with growth. It is well known that agglomeration and densification of economic activities (and habitations) in urban conglomerations stimulates economic efficiencies and provides more opportunities for earning livelihoods. Possibilities for entrepreneurship and employment increase when urban concentration takes place, in contrast to the dispersed and less diverse economic possibilities in rural areas. This enables faster inclusion of more people in the growth process and is therefore more inclusive. The condition of the poor in rural India must continue to get major attention but the urban sector cannot be neglected, and left to grow without specific policy attention, if the country wishes to have more inclusive growth.

12.2 An interesting aspect of the urbanisation trend revealed by the Census is that the number of towns in India increased from 5,161 in 2001 to as many as 7,935 in 2011. It points out that almost all of this increase reflects the growth of 'census' towns (which increased by 3,894) rather than 'statutory' towns (which increased by only 242). 'Statutory' towns are towns with municipalities or corporations whereas 'census' towns are agglomerations that grow in rural and peri-urban areas, with densification of populations, that do not have an urban governance structure or requisite urban infrastructure of sanitation, roads, etc. As more Indians will inevitably live within urbanized conglomerations, with densification of villages, sprouting of peri-urban centres around large towns, and also migration of people into towns, the quality of their lives and livelihoods will be affected by the infrastructure of India's urban conglomerations. The infrastructure of India's present towns is very poor. Sewage, water, sanitation, roads, and housing are woefully inadequate for their inhabitants. The worst affected

are the poor in the towns. As more urban conglomerations form and grow without adequate infrastructure, the problems will only become worse. Therefore India's urban agenda must get much more attention.

Urbanization – Challenge & Opportunity

12.3 As stated above, the expansion of urban India is the platform for industrial and modern service sector growth and the creation of greatly improved income opportunities for the youth of this country. In order to realize the opportunities that urbanization offers and to successfully resolve its accompanying challenges, a combination of several initiatives is needed.

- First is to step up investment in new urban infrastructure assets and maintenance of assets. It is estimated that a total of about Rs. 40 lakh crore (2009/10 prices) as capital expenditure and another about Rs.20 lakh crore for operation & maintenance (O&M) expenditure for the new and old assets will be required over the next twenty years.
- Second, is to strengthen urban governance. A unified and effective administrative framework is necessary in urban areas with clear accountability to citizens. The elective office of mayor supported by the necessary administrative powers and machinery can provide the required framework. This may require significant changes in administrative rules to delineate clear areas of accountability for elected representatives with reasonable tenures in office.
- Third, is to strengthen the 'soft infrastructure' simultaneously with the building of the hard infrastructure. Therefore, along with the strengthening of governance structures, the enormous weakness in the capacity of human and organisational resources to deal with the challenges posed by the sector must be addressed. Efforts must be made to redress this situation in collaboration with State Governments, ULBs as well as private sector.
- Fourth, is to give adequate emphasis to long term strategic urban planning to ensure that India's urban management agenda is not limited to 'renewal' of cities. It must also anticipate and plan for emergence and growth of new cities along with expansion of economic activities. The urban planning exercise, therefore, has to be situated not only in the specific context of municipal limits but also encompass the overall regional planning perspective.
- Fifth, is to address the basic needs of the urban poor who are largely employed in the informal sector and suffer from multiple deprivations and vulnerabilities that include lack of access to basic amenities such as water supply, sanitation, health care, education, social security and decent housing. They are also not sufficiently represented in the urban governance process.

- Sixth, is to ensure the environmental sustainability of urban development. As this is a highly complex process which requires co-ordination of different facets of urban development, the strategy would require creation of an institutional mechanism for convergent decision-making so that cities become environmentally sustainable. Such an approach would be in line with the objectives of the National Mission on Sustainable Habitats which seeks to make cities sustainable through improvements in energy efficient buildings, management of solid waste and a shift to public transport.

12.4 The urban agenda mentioned above can be described under three headings:

- Desired Inputs
- Expected Outputs/Outcomes
- Instrument of Policy/Funding Intervention

Desired inputs

12.5 Long term urban planning must focus on the development of regions, not merely on the condition of existing cities and towns. Within the region, the aim should be to identify small and medium size towns and expanding villages that have locational or natural resource advantages for future socio economic growth. Spatial growth around such nodes may be guided by planning and investment of funds for their infrastructure. Such nodes invariably have some in-built advantages, such as lower cost of land, but at the same time many serious drawbacks too such as poor connectivity and inadequate municipal services. If such issues are addressed by longer term, and spatially wider urban planning, then both the pace and the process of urbanization can be improved.

12.6 Urban infrastructure needs to be strengthened across the board. Primarily:

- Provision of basic amenities like safe drinking water, sewerage and sanitation facilities in urban conglomerations, while also ensuring that the urban poor have access to these facilities at affordable cost.
- Improved water management, including recycling of waste water in large cities and new townships.
- Transportation in urban centres is a major constraint. Currently, public transport accounts for less than 25 per cent of urban transport in India. Therefore urban mass transit including metro, rail, electric buses and trams as well as other forms of public transport must be greatly strengthened especially in under-served urban centres.
- Strengthening preventive healthcare, including 100 per cent vaccination, safe drinking water, management of MSW and ambient air quality and aggressive control of vectors that cause diseases. A National Urban Health Mission may be considered to meet these objectives.

- Strengthening the secondary and tertiary healthcare systems using PPP models wherever possible, and ensuring adequate availability of such services to weaker sections.
- For inclusive urban growth, policy initiatives must result in an enabling environment for productive and dignified self-employment. Permissions, as well as provisions of spaces and other facilities for small enterprises are necessary. Institutions of self-help groups, producer societies, and other forms of cooperatives can be one approach amongst others. The formation and growth of formal enterprises may be facilitated too to enlarge opportunities for good employment within the cities.
- The Skill Development Mission must be geared to creating extensive skilling facilities for a wide range of contemporary occupations.
- The housing business is largely in the private sector. Government should consider using land as leverage for market based strategies and PPP models to greatly improve the scope of affordable housing for weaker sections.
- The condition and needs of the most vulnerable urban citizens must always be kept in the forefront if urbanisation is to be inclusive – Mahatma Gandhi's principle of *antyodaya*. Without doubt, the most vulnerable are 'street children' in Indian cities, who have no option than to live and work in miserable conditions on the streets. Safe housing and care of the elderly is also becoming a major concern in Indian cities.

Expected Output/Outcomes

12.7 The emphasis on urban development, keeping in mind both quality as well as geographical spread, should result in improvement of the ability of urban aggregations to gainfully accommodate migrants from rural India.

12.8 The urban centres and their peripheries should become the launch-pads for expansion of manufacturing and modern services. Economies and innovations within them should provide the country with the desired global competitive edge in larger numbers of products. Such economies of agglomeration would also enable the country to take full advantage of its diverse production base. Thus urban conglomerations can create employment opportunities for a variety of skills and talents.

12.9 Improved urban amenities and infrastructure would not only create acceptable quality of urban life for its large urban population including its vulnerable groups but should also allow India to realise its full potential of emerging as a major tourist

destination in the world – which it is not yet in spite of the country's 'incredible' range of potential attractions for tourists.

12.10 Urban centres have also to serve the interest of S&T development and become centres of innovation. However, in order to create the appropriate environment for the pursuit of higher education and scientific and technological research special efforts need to be made to earmark those areas of urban space that are best suited for it.

12.11 Policy interventions like the *Rajiv Awas Yojana* (RAY), coupled with policy measures for augmenting the supply of affordable housing, and expanded access of subsidized healthcare and education to the urban poor should result in a significant reduction in the proportion of slum dwellers and in geographical spread of slums.

Instruments for Intervention

12.12 Implementation of a comprehensive agenda for managing the urban transition requires action on several fronts

Governance

12.13 The regulation of urban centres is presently characterized by fragmented authority and responsibility and weak political accountability. The 74th Constitutional Amendment Act (1994) sought to provide clear constitutional status to Urban Local Bodies (ULBs). The range of functions that the ULBs are supposed to discharge is very wide and is in most cases asymmetric with respect to their authority vis-à-vis the State Governments and their financial resources.

12.14 Elections to most ULBs have been held but these bodies must be invigorated and enabled to discharge their responsibilities. At present, ULBs have become too much subordinate to the State Government machinery. It is imperative they have adequate autonomy to function effectively.

12.15 It is also imperative to demarcate a careful division of responsibilities between State level bodies, Regional planning authorities and Urban Local Bodies (ULBs). Therefore the 18 functions listed in the 12th Schedule of the Constitution must be broken into specific activities and responsibility for each activity assigned to the level which is best suited to perform that function.

Capabilities

12.16 Administration and technical management of urban development must become more professional. Technology must be deployed to improve service delivery and governance. Capacity building must extend to training of elected representatives in urban governance issues. Since these problems are not unique to any single ULB, the Central Government should catalyze an ongoing process of capacity building and improvement by creating institutions of excellence as well as interactive forums for sharing best practices.

12.17 Changes in power and capabilities of functionaries should result in their capacity to discharge their municipal obligations, as well as capacity to generate financial resources through taxation and fees which will strengthen their autonomy.

Financing

12.18 The investment requirements for delivering necessary infrastructure services in urban areas are huge. The High Power Committee on Indian Urban Infrastructure and Services which was appointed by the Ministry of Urban Development has recently submitted its report and has estimated that water supply, sewage, solid waste management, storm water drains, urban roads, urban transport and urban street lighting would require an amount of Rs. 39.2 lakh crore (at 2009-10 prices) over the next twenty years to meet the requirements of the projected urban population, meeting currently established standards. The Committee recognised that budgetary resources can at best play a catalytic role in channelizing investment to this sector. There has to be a two-pronged strategy to bridge the gap in resources: to create a policy environment for fostering cost-saving innovations; and mobilisation of resources through innovative methods of financing, particularly by unlocking the value of urban land.

12.19 Achieving financial sustainability through own resource mobilization of city level governments has been an important objective of JNNURM which must be considerably strengthened in the 12th plan period. Besides attracting private investment, unlocking the value of land for financing infrastructure projects, with intelligent use of Impact Fees and higher FSI, should form a core element of policy initiatives. Better management of property taxes and realization of fair user charges are other sources which need to be tapped by urban local bodies.

12.20 A massive push is needed to attract private investment in all areas of urban infrastructure, both for large infrastructure projects and in bulk water supply, waste water recycling, treatment of MSW and treatment or urban sewerage. This should be done under an extended '4P' framework—People-Private-Public Partnerships as experience across the world

indicates that in urban renewal and management, the role of 'People' in design of projects and partnerships is crucial, much more so than in large infrastructure projects such as highways, airports, power, power plants, etc. in which 'People' have a relatively limited role in the ongoing governance of the projects and their outcomes. Therefore best practices and models for 'PPPP' must be evolved and deployed for India's urban management agenda to succeed. These PPPP projects may become more viable if a subvention from property and other urban taxes is imaginatively used to meet any financial gap in the projects where felt necessary.

Urban Planning

12.21 Much more attention should be given to 'urban form'. What is the shape and type of city that is desired? The capacity for urban design and planning must be developed to address such systemic issues taking into account all necessary and inter-connected parameters. Urban planning cannot be limited to spatial allocations and engineering solutions: it must encompass and connect various socio-technical considerations too.

12.22 There is an urgent need to shift focus towards an outcome-based approach that is based on service level delivery rather than an approach that focuses only on investments and asset creation.

12.23 International studies confirm that there cannot be a model blueprint of a "world class" city. 'World class' cities vary considerably in their shapes and flavours. Many large cities in North America and Europe had to undergo substantial renewal and became world class through a process of participative evolution. The spirit of Indian democracy and desire for further devolution makes it imperative that urban planners of Indian cities master participative processes of planning that enable citizens to shape the cities they want. In fact this may be the key to an ongoing process of urban renewal and growth in the country.

Interventions by the Central Government

12.24 The Central Government's thrust on guiding and improving the quality of urbanization in the country must be intensified. The JNNRUM, the flagship program, will have to continue in some improved form. It must be redesigned and improved to incorporate the lessons learned so far and to suit the next stage of India's urban renewal. The *Rajiv Awas Yojana* (RAY) has been outlined as another major program for urban improvement specifically from the perspective of prevention of slums and improving the condition of the urban poor. As mentioned before there must be more coordinated management of infrastructure within towns and cities. Therefore, Central Government programs must also converge and the new JNNRUM and RAY should be integrated into a coherent program. Until the new program is introduced in the Twelfth Plan, there must be no hiatus in the implementation of existing projects of JNNRUM that have been partially completed. Therefore a suitable transition arrangement will need to be made.

12.25 The key principles for designing the new flagship programme, derived from evaluations of present programs, as well as the analyses done to frame RAY, should include:

- Take a 'whole city' approach to planning and improvement (slums cannot be prevented by focussing on just the slums: the layout and distribution of infrastructure of the whole city must be considered)
- A 'city master plan' must be much more than a zoning plan and an engineering plan for the 'hard infrastructure'. It must address the condition of social services and progressive improvements in the 'soft infrastructure'.
- Focus on the needs of the poorest inhabitants of the city. The richer inhabitants are able to look after their needs through private arrangements, and thus private enclaves will grow side by side with ghettos of the poor if the needs of poorer citizens are not given primacy
- Better management of land use, and leveraging of land values to finance infrastructure
- Innovations in assignment of 'property rights' to enable poorer sections to participate in the orderly development of cities by their ability to access finance
- Strengthen the ability of urban local bodies to finance the maintenance and building of infrastructure
- Avoid 'one size fits all' solutions.
- Decentralise decision making and ensure participation of all stakeholders including the local communities so that schemes are suitably calibrated to meet local requirements and aspirations

12.26 The National Development Council, while reviewing the Mid-Term Appraisal of the XIth Plan, had noted the importance of the urban sector for inclusive growth, as well as the challenges that need high-level attention by the Centre and the States. A Sub-committee of the National Development Council (NDC) has been set-up to focus on the urban sector. The Sub Committee will consider the recommendation of the High Power Committee on Indian Urban Infrastructure and Services and hopefully also deliberate on the issues raised in the Approach Paper. The findings of the Sub-Committee and its recommendations will be invaluable in formulating the Twelfth Plan.

13

Science and Technology

13.1 As the Indian economy and society grow and modernize, the Indian Science & Technology landscape also has to change to meet the magnitude of demands being made. The change should take care of the new responses needed including delivery models for innovative deployment of technologies and business models for financing deployment of innovations. This would require adjustments in the existing governance and management models in our universities, research institutions and laboratories for supporting strategic goals in this area. Current practices and policies do not promote this objective sufficiently. This calls for a well enunciated Science, Technology and Innovation policy, which is supported by an ecosystem that addresses the national priority for inclusive and accelerated growth. We also need to migrate from defensive decision syndrome to trust based decision logic and from risk averse to risk prepared social behaviour. While, this chapter focuses on Science and Technology Development, issues related to Innovation are explored in chapter XVI.

Aligning S&T to Developmental Needs

13.2 There is a wide range of areas that would require breakthrough innovations and significant S&T inputs. These include energy, water management, farm production, medical research, waste disposal, health care, communications, and so on. In order to play a productive and appropriate role to service these national needs, several critical decisions are needed which affect the S&T system.

13.3 The resource needs for creating a strong R&D system are substantial. At present, R&D expenditure in the country is only about 0.9 percent of GDP, of which about three fourths is in the public sector and only one-fourth in the private sector. This is simply not adequate to develop strong R&D. We must take steps to ensure that total expenditure in R&D increases to 2 percent of GDP by the end of the Twelfth Plan. This could consist of about 1 percent in the public sector and 1 percent in the corporate sector, including PSUs. At present, the resources

devoted to R&D by our large public sector organisations are far too small. They should be incentivised to make larger provisions. This should not be just for in-house R&D. They should fund R&D in research institutes and universities, both public and private. The need for such deployment of resources is very crucial particularly by our energy PSUs.

13.4 The system must undergo a paradigm shift from the current input driven model to an output directed development strategy. This would involve communicating with user segments in various parts of Indian society and industry and work towards finding solutions and applications that correspond to such felt needs. Not only is this a vitally important transition for re-orienting the direction and priorities of S&T activities, it is also necessary to open up new funding avenues for public and private agencies, clearly expecting and securing benefits from their association with the S&T sectors;

13.5 Over the years, several areas of science and technology have been identified with appropriate institutional frameworks to enhance India's R&D base and capability. A critical review of their continuing relevance has to be conducted, as deemed necessary, by the concerned Department and/or agency. Such a step could release the much needed resources, both financial and human, to the present priority areas. Moving some of the research programmes to the University system from the national laboratories and agencies is a case point.

13.6 It is necessary to create a framework that takes into account the entire life cycle of ideas beginning with discovery/creation to commercialization, extension and value addition. It is success in this area alone that can stimulate appropriate innovation across the wider system. To achieve this, current institutional structures and mechanism would require:

- A holistic approach to public funding of Research and Development (R&D) for socially relevant projects and treat the entire knowledge domain of R&D as connected.
- Much larger base of full time researchers and flexibility in hiring them;
- Greater autonomy to work in a clearly defined charter ;
- More flexibility to the younger generation of scientists to pursue their ideas and greater mobility between industry, academia and R&D institutions;
- Enhanced scope and process of inter-institutional and International collaborative research;
- Significant participation of socio-economic Ministries & States in technology deployment process;
- A culture of world class publicly owned and privately/autonomous managed S&T institutions;

- A well-crafted strategy for technology acquisition in high-tech areas;
- Significant changes in HR, financing, procurement policies and importantly a transparent performance appraisal system.

Interaction of Public S&T Institutions with Industry

13.7 Significant Changes will have to be brought in current interaction of publicly-owned S&T establishment with industry, both in public and private sector. This should result in a significant enhancement of the private sector R&D expenditure, which is presently estimated at around 25 per cent of national R&D expenditure to at least 50 per cent in the Twelfth Plan.

13.8 The important elements which may play the catalytic role in achieving this outcome are: first, leveraging the Government grants and other forms of financing, to secure private financial flows and support around a demand driven R&D development path. Industry, both public and private, would also need to be incentivized to invest at least 2 per cent of their sales turnover in R&D. The second is developing a workable protocol for facilitating interaction amongst these players. This would cover a range of issues, from the nature of testing to that of the regulatory framework and the facilitation of foreign direct investment (FDI) in related R&D activity.

13.9 R&D activities by MNCs such as GE, Motorola, Texas Instruments, CISCO, DuPont, Honda etc. have created enclaves for world class technological development and have helped the creation of a pool of highly skilled scientists and technologists through setting up their R&D centres in India. Large Indian companies may be encouraged to establish similar centres. Many of them are now global companies with large interests worldwide in metals, engineering, energy, medicine, etc. and they have the organizational and financial capacity to recruit top-class S&T personnel from across the world. In this way the current S&T divide between us and the advanced economies can be partially bridged. Government can play a facilitating role to enable these centres to come-up.

Research in Strategic Sectors

13.10 The innovative component of several technologies that have been developed by the three strategic Departments of Atomic Energy, Space and Defence Research and Development, for their own respective needs, could trigger unique mechanisms for encouraging innovation and ensuring the right impact on social, industrial and strategic sectors in the Twelfth Plan. Examples of successful spinoffs such as automatic weather stations, fleet monitoring equipment and telemedicine systems developed by ISRO; the instrumented pipeline inspection gauges, food processing/irradiation technologies developed by DAE and biomedical instruments, diagnostic kits and bio toilets for water scarce areas developed by DRDO are but a few examples of the enormous potential that exist for further technology transfers to industrial and service sectors. In order to facilitate this, special directorates have been set up at the headquarters of the three Departments essentially to serve as a clearing house of the relevant information on technologies and also to coordinate, share and exchange information leading to new strategies on the deployment of these technologies. Linkage with the industry associations is another dimension which would need additional thrust in the Twelfth Plan.

National Missions

13.11 PAN India mission mode projects addressing National needs and priorities should be launched, through extensive participation of stake holders, in the areas of Health, Water, Energy, food and environment security with the objective to achieve the goals and targets in a defined time frame.

13.12 Major research concerns for Agriculture sector relate to water management, soil degradation and fatigue; genetic erosion, increasing biotic and abiotic pressures; inefficient energy management; inadequate markets and unfavourable trade, increasing knowledge lag; management and protection of farm produce and harvest and post-harvest losses. Furthering R&D efforts in precision agriculture using space technology inputs for detailed assessment of biotic and abiotic stresses, creation of spectral library for various crops and soils and application of microwave remote sensing and polarimetry for soil moisture, crop identification etc. is essential. Resource Conservation Technologies for improving input use efficiency and choice and responsible use of biotechnology tools and realistic assessment of their potential in crop and livestock improvement are essentially needed for new generation designer crop plants; bio-fortification of staple food crops, pre-breeding for resistance/tolerance to various stresses; microbial genomics in search of new genes; and research solutions for secondary agriculture. There is also a need to review the present state of agriculture education with the aim at improving and sustaining quality of higher agriculture education for addressing emerging challenges for livelihood security and sustainable development. It is also necessary to re-examine the architecture of agricultural extension services in the country.

Dialogue with Other Countries

13.13 We must expand the scope of our dialogue with both the advanced and emerging economies in the sphere of defining S&T focus areas and avenues for exchange of information and purposeful collaboration. To make this dialogue more meaningful, it has to be mediated through a framework that takes into account the realities of strategic national interest and the diplomatic charter. Collaboration at the level of academic research etc., is an activity that will in any case carry on, but it should not be confused with the Government sponsored dialogue with S&T establishments of our key counterparts in the rest of the world. Meaningful dialogue pre-supposes the achievement of a certain level of technical competency, such as in our participation in ITER.

13.14 The Twelfth Plan must identify half-a-dozen areas where our key technological competency can allow us to conduct this dialogue at the level of peers and permit participation in international projects. This will also place us in a better position to carry forward S&T dialogue with other developing nations.

Expansion of Basic Science

13.15 The energization of S&T activities cannot be de-linked to the expansion and deepening of basic science teaching and research in our scientific centres of learning (universities and teaching institutes). It is hard to envisage how basic scientific research can be carried forward if the leading centres of science teaching do not have an active role in this process. Therefore, the creation of greater infrastructure and more project-related funding for expanding the quality of basic science teaching and basic science research is, in the ultimate analysis, a prior condition for the expansion of the scope of S&T intervention in the development of the wider economy and society.

13.16 Finally, the institutional concepts which were initiated in earlier Five Year Plans, like the Inter University Centres and Inter-Institutional Centres for enhancing research and educational linkages for Universities, are to be expanded further to cover many other inter-disciplinary research areas such as Earth System Science, life sciences, Computational Science, Cognitive Science etc., during the Twelfth Plan to bring about functional connectivity across universities and domain institutions. This would also overcome regional disparities in the quality of education/research.

14

Services: Tourism, Hospitality & Construction

Need for Employment Opportunities

14.1 A principal goal of the XIIth Plan is to increase the pace of inclusion of much larger numbers of people in the process of growth through the creation of more jobs and more enterprises. The Service sector is the principal generator of employment in India. Much attention has been paid to the growth of the IT enabled service (ITES) sector in this context. However ITES, though important is only a small component of the employment enhancement in services. GDP in ITES has grown rapidly, but even so, the growth of GDP in ITES was only 12% of the total growth in GDP in the services sector. There are several other sub-sectors in services which are potentially very important sources of employment growth. These include Tourism & Hospitality and Construction. There is also a large employment potential in the health sector where human resources are much below the levels needed. The Health Sector is discussed in a separate chapter. This chapter concentrates on the tourism & hospitality and construction sectors.

Tourism

14.2 The World Travel & Tourism (T&T) industry accounts for US $ 7,340 billion of global economic activity, and this is forecasted to grow to US $ 14,382 billion by 2019. It also accounts for approximately 7.6% of global employment. The Tourism and Hospitality sector has a key role to play in promoting faster, sustainable and more inclusive economic growth—the goal of the 12th Five Year Plan.

Potential / Opportunities

14.3 Across the world, the tourism industry is one of the largest generators of employment. In India, the travel and tourism sector is estimated to create 78 jobs per million rupees of

investment compared to 45 jobs per million rupees in the manufacturing sector. Just as manufacturing must be boosted to provide jobs for India's burgeoning youth population, the potential of tourism to provide income opportunities must be seized too. Along with construction, it is one of the largest sectors of the service industry In India. It accounts for about 8 percent of total employment. It is capable of providing employment to a wide spectrum of job seekers from the unskilled to the specialised, even in the remote parts of the country. Finally, compared to other modern sectors, a higher proportion of tourism benefits (jobs, petty trade opportunities) accrue to women. Internationally, women account for 70 percent of the workforce in the travel and tourism industry. Hence, growth of the tourism sector is more inclusive than other sectors.

14.4 Tourism and Hospitality is a diverse industry, being a collection of activities, comprising transportation, accommodation, eating and drinking establishments, retail shops, entertainment businesses and other hospitality services provided to individuals or groups travelling away from home for leisure, business or other purposes. The broad scope of economic activities involved in tourism enables wide participation in its growth, including the participation of the informal sector, because the skill requirements for most of the jobs are modest and can be relatively easily acquired. Furthermore, tourism is highly dependent upon natural capital (e.g. forest, wildlife) and culture. These are assets that some of the poor have, even if they have no financial resources.

14.5 The interaction of tourists, business suppliers, host governments and host communities in the process of attracting and hosting the tourists and other visitors gives rise to both demand for, and supply of, a wide range of tourism related goods and services. Therefore, tourism has good potential to stimulate overall economic growth. A marginal shift in investment to the tourism sector has the potential to propel India to a faster growth trajectory.

Issues & Challenges

Need for Preserving Natural Resources

14.6 In 1988, World Tourism Organization (WTO) defined sustainable tourism as 'leading to management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity and life support systems.' Later in 1992, the 'Earth Summit' in Rio established the triple principles of environmental, economic and social sustainability. Since then, the principles of sustainable tourism have been adopted by the tourism industry worldwide. In India, the tourism sector is based on exploiting its unique endowments of biodiversity, forests, rivers, and its rich culture and heritage .The challenges in this sector lie in successfully preserving these in

their original form, and making them accessible to domestic and international travellers. Tourism in India has the potential to create economic interest of local communities in the protection of its natural and cultural endowments leading to a more sustainable growth.

Low Growth Rate of Tourism Sector

14.7 The annual growth of the Tourism sector is estimated to be 8.1 percent during the last five years which is marginally lower than the overall economic growth of 8.2 percent expected to be achieved during the Eleventh Five Year Plan. Under the business-as-usual scenario, the Tourism sector is forecasted to grow by 8.8 percent per annum during the period 2011-21 even though, according to the World Travel and Tourism Council (WTTC), tourism in India has the highest ten-year growth potential in the World during 2009–2018. The expected growth of the tourism sector is, therefore, inadequate both in terms of its contribution to the overall economic growth and it's potential. The approach to tourism in the XIIth Plan must focus on achieving a substantially higher growth rate than the aggregate growth.

Capacity Constraints

14.8 The realization of the country's huge, barely tapped, tourism potential is contingent upon simultaneously addressing the multiple challenges thrown up by capacity constraints and inadequate policies. These constraints include inadequate transportation infrastructure; accommodation; land; multiple taxes and an overall high tax burden; inadequate financial resources for enterprises; skills; safety and hygiene conditions around tourist attractions; and convergence of actions by multiple agencies. The challenges are further magnified in the context of a federal structure where the responsibilities for policy making and implementation is fragmented across levels of government and co-ordination between them is often lacking.

Strategy

14.9 In order to realize the potential of this sector, the Government would need to adopt a 'pro-poor tourism' approach aimed at increasing the net benefits to the poor from tourism and ensure that tourism growth contributes to poverty reduction. The benefits may be economic, social, environmental or cultural. A wide range of actions are needed to increase the spread of benefits from tourism to the weaker sections. These go well beyond simply promoting community tourism, heritage tourism, eco-tourism, wellness tourism and the like. There is need for a diversity of actions, from micro to macro level, including product and infrastructure development, marketing, branding and promotion, planning, policy and investment. A comprehensive set of strategies need to be developed for this purpose.

14.10 A principal strategy to realize India's enormous assets with tourism potential viz., historical sites, places of religious significance, and its vast range of national attractions, must be to focus on clusters or circuits around such assets. The development of these clusters / circuits requires collaboration between many agencies at the local level to create an attractive and safe transit experience. Therefore, development of tourism requires that States take a leading role in developing their own tourism potential to obtain growth in employment as well as State Domestic Product. The strategies can be divided into those that generate three different types of local benefit: economic benefits, non-cash livelihood benefits (such as physical, social or cultural improvements), and less tangible benefits of participation and involvement.

14.11 The strategies for creating economic benefits will need to tackle many obstacles to economic participation, including lack of skills, low understanding of tourism, poor product quality and limited market access. It will have to focus on eliminating these bottlenecks and include:

a. Expansion of local employment via commitment to creation of local jobs and training of locals for employment;

b. Expansion of business opportunities for small and micro businesses and entrepreneurs that sell inputs such as food, fuel, or building materials either to businesses engaged in tourism or directly to tourists, such as guiding, crafts, tea shops etc. Support to such micro businesses can vary from marketing and technical support (e.g. by nearby mainstream operators), to shifts in procurement strategy, or direct financial and training inputs; and

c. Development of collective community income by way of equity dividends, lease fee, revenue share, or donations for use of community resources, in particular, land to develop infrastructure and other facilities usually in partnership with tourism operators or government institutions.

14.12 Similarly, the strategies to enhance non-cash livelihood benefits to the locals will focus on -

a. Capacity building, training and empowerment;

b. Mitigating of the environmental impact of tourism on the poor and management of competing demands for access to natural resources between tourism and local people;

c. Improving social and cultural impacts of tourism; and

d. Improving access to services and infrastructure like health care, security, water supplies, transport, hygiene, sanitation, waste disposal etc.

14.13 The implementation of these strategies will involve developing formal and informal links between all stakeholders and coordination across all levels of Government. It would be

necessary to establish a 'whole government' agenda for tourism development between departments at national level and between national and local government so as to create convergence and synergy across programs. This requires that awareness is created amongst all stakeholders and across government about the contribution of tourism to local livelihoods and engage them in joint initiatives to increase the local economic development and impact on poverty reduction. The National Tourism Policy should form an integral part of the poverty reduction strategy during the Twelfth Five Year Plan.

Construction

14.14 With the consistent attention being given to infrastructure development and the increasing demand of housing in the country, the Construction sector has been growing at a compounded annual growth rate (CAGR) of about 11.1 per cent over the last eight years. The Construction sector accounts for around 9 per cent of GDP today. (The contribution of Construction to GDP from 2005 to 2009 is given in Table 14.1.

Table 14.1

Construction Sector: Contribution to GDP

Year	GDP (at current Prices) (new series) (Rs. crore)	GDPfc: Construction (at current prices) (new series) (Rs. crore)	Percentage Contribution of GDP by Const. Sector to Total GDP
2005	28,77,701	2,12,807	7.4
2006	32,82,385	2,64,173	8.0
2007	37,79,385	3,19,180	8.4
2008	43,20,892	3,76,266	8.7
2009	49,33,183	4,37,017	8.9

14.15 Development of world class infrastructure is required to achieve faster growth of the economy. Considering the critical need of developing infrastructure in the country, construction activities are crucial for creating physical infrastructure in the country. Construction, on average, accounts for more than half of the investment required for setting up critical infrastructure facilities like power projects, ports, railways, roads, bridges etc. given the high construction intensity in such projects (Table 14.2).

Table 14.2

Construction components involved in creation of physical infrastructure

	Construction Intensity (%)
Building	76
Roads	63
Bridges	65
Dams, etc.	75
Power	38
Railways	78
Mineral Plant	18
Medium Industry	20
Transmission	22
Urban Infrastructure	66
Maintenance	81

14.16 The Construction sector is critical for enhancing the productive capacity of the economy. It has strong linkages with various industries such as cement, steel, chemicals, paints, tiles, fixtures and fittings. While in the short term it serves as a demand booster, in the long term it contributes towards boosting the infrastructure capacity. This is also evident from the fact that infrastructure construction accounts for the maximum share (54 per cent) of construction activities. Industrial expansion contributes to 36 per cent of overall construction activity, and

residential and commercial 5 per cent each. As India embarks upon an accelerated drive for infrastructure creation, it would be critical to enhance the capacity and capability of the construction sector.

Opportunities

14.17 Considering that the target of double digit growth of the economy will be difficult to achieve without infrastructure growth, ambitious plans for investment into various sectors of physical infrastructure are being prepared and the cumulative investment in infrastructure in the XIIth five year plan is targeted at around $1 trillion. Nearly half of this investment will be channelized into construction projects.

14.18 Growth of the Construction sector will also give a boost to many other economic activities. It will stimulate substantial growth in the construction equipment industry as well as a host of other down-stream industries like cement, steel, paints/chemicals, fixture & fittings, bricks & tiles, non-ferrous metals/plastics/glass, timber and wood based products et al.

Employment Potential

14.19 The Construction sector provides direct / indirect employment to about 35 million people and is expected to employ about 92 million persons by 2022 as described in Table 14.3. Thus almost 50 million additional jobs may be created in Construction in the next 10 years.

Table 14.3
Requirement of human resources for Construction (2022)

Engineers	3.72 million man years
Technicians	4.32 million man years
Support Staff	3.65 million man years
Skilled Workers	23.35 million man years
Unskilled/ Semi skilled workers	56.96 million man years
Total Manpower	92 million man years

Issues and Challenges

Manpower Shortage

14.20 To sustain the growth of the Construction sector, a substantial addition (estimated about 4 million per annum) is necessary to the workforce in coming years. Hence, better managed processes are required for the development and deployment of human resources for this industry.

Delay in projects

14.21 Delay in construction projects can be attributed to many reasons, some of which are listed below:

a. Construction projects involve clearances and permissions from various departments. At present, construction activities are hampered on account of delay in obtaining such statutory clearances and permissions from multiple agencies.

b. Delays in land acquisition seriously affect the projects and add to their costs.

c. Implementation of plans also gets delayed due to many reasons. e.g. financial constraints, lack of resource mobilization, over ambitious plan proposals, lack of integration between spatial planning proposals with economic development plans and inadequate legislative support and enforcement.

Low Competitiveness of Small Units

14.22 The current construction space is highly fragmented, with about 3 million units, of which only about 28,000 are registered. Construction activities, especially in infrastructure and industrial projects require sound technical expertise, which may not be available to the small players. Therefore it becomes difficult for them to participate in this segment without technological capability and skilled personnel.

Strategies

Skill Development

14.23 Considering the demand for workforce for Construction, the industry and government should further strengthen the mechanism for providing training to unskilled workers who constitute bulk of the workforce. Some initiatives have been taken in this regard, e.g. National Skills Development Corporation (NSDC) is facilitating a Sectoral Skill Council (SSC) for the Construction Sector. An ambitious target of training-cum-certifying 35 million construction

workers by 2022 has been fixed and the process of formation of the Skill Development Council for the Construction sector is already underway. Such efforts need to be further expanded in order to meet the workforce requirement of the sector.

14.24 Some of the other human resource challenges that need to be addressed include:
a. Increasing the number of qualified trainers to bridge the future demand of quality, skilled manpower in the Construction sector

b. Setting up an institutional framework to ensure the quality of training imparted at various training institutes across the country, e.g. setting up an umbrella organization for providing certification and accreditation to training institutes across the country

Improving Coordination and Streamlining Processes

14.25 The approach should also be to focus on improving the coordination and streamlining of approval processes in each infrastructure vertical. Some of the other areas that may require focus are:

a. Modification in some of the provisions of Arbitration and Conciliation Act, 1996

b. Resolving the delays that occur due to multiple levels of appeals in Dispute Resolution Mechanism, e.g. while parties in dispute may be allowed to appeal against the decision of the DRBs / Arbitration Tribunals, they should in interim be required to comply with the decisions of the latter.

c. Standardization of contract documents for efficient and timely implementation of projects.

d. The plethora of levies imposed on the Construction industry such as royalties, premiums and cess should be streamlined under the ambit of GST.

Improving the Competitiveness of Small Units

14.26 Given the highly fragmented nature of the Construction sector, there is a need to focus on improving the competitiveness of smaller units. In addition, there is a need to increase the levels of registration in this space. The Construction sector has a large share in service sector activities, with some distinctive features, and hence requires special attention in policy formulation so that it develops in an orderly manner and contributes to creation of high quality assets and good employment too in India's growth process.

15

Governance

15.1 With rapid expansion of the economy, rising per capita incomes, and growing awareness and assertion of rights by an increasingly educated population, both the need for good governance and the demand for good governance have increased. Good governance is needed for effective implementation of Plan schemes. It is also needed for ensuring that ordinary citizens can effectively access the public services that are their right. Finally, it is needed for a better functioning of the private sector in the economy. Poor governance leads to corruption, both petty and large, both of which corrode the moral fabric of society. Large scale corruption occurs either because of mishandling of government contracts, or because discretionary decision making in some areas is used to the advantage of some. Corruption undermines the legitimacy of the system in the eyes of the public and reduces potential for achieving efficiency through competition.

15.2 In this Chapter, we consider the role of good governance first in the context of implementation of Plan programmes and later in the broader context of the functioning of the society as a whole. The need to deal with the problem of corruption is addressed in the second section.

Good Governance and Implementation of Government Programmes

15.3 As noted in Chapter 1, there has been a dramatic rise in expenditure on programmes of social inclusion in the last five years but this is accompanied by growing complaints about implementation. The weaker sections of the society, for whom these schemes are primarily intended, are often not able to benefit because they are not sufficiently empowered to access the benefits due to them. This is despite the fact that there have been a number of legislations aimed at securing legally guaranteed rights to the Indian people, through the Right to Information Act, the Forest Rights Act, the Right to Education Act, the Mahatma Gandhi National Rural Employment Guarantee Act and the soon to be introduced National Food Security Act.

15.4 Part of the problem is that the enactment of right based schemes in an environment of illiteracy and lack of awareness and empowerment does not ensure that people will claim their rights. However, it is also true that the schemes continue to be implemented in a business-as-usual mode, while what is demanded by these programmes is an innovative break with the past. Without reforms in implementation structures, schemes aimed at social inclusion will continue to be afflicted by the universalization without quality ("U without Q") syndrome. A broad range of reforms, cutting across programmes, are needed in the areas is enumerated below:

Building Quality and Strengthening Local Institutions

15.5 The ability to organize and get things done on time and without waste of resources is central to effective implementation The Japanese experience with Total Quality Management (TQM) is particularly relevant in this context. Seven simple tools of 'Total Quality Management (TQM)' were disseminated across Japan in the 1960s and 1970s, not only in factories, but also offices, educational institutions, and other organizations.

15.6 A fundamental requirement for achieving quality is that the responsibilities for management must be effectively devolved to bodies responsible for implementing public programmes and they must be suitably empowered, and also learn how to manage and produce results. An important reason for the relative lack of success of many flagship programmes in India is that the local institutions that should run these programmes are not adequately empowered. The 73rd Amendment, transferred functions to PRIs, but there has been very little effective devolution of funds or of control over functionaries. Since 2004, there has been massive increase in funds available for programmes, especially after MGNREGA, which are meant to be managed at the local level but these funds are not under the effective control of the PRIs. Action in this area lies predominantly with state governments.

15.7 There is also need for strengthening other local institutions which would help programme implementation. The potential power of the National Rural Livelihoods Mission (NRLM), for example, lies in the economies of scale created by SHG Federations (comprising 150-200 SHGs each). This is evident, for example, in bulk purchase of inputs (seeds, fertilisers etc.) and marketing of outputs (crops, vegetables, milk, NTFPs etc). Similarly, Watershed Committees and Water Users Associations need strengthening as do the Forest Protection Committees. It is only if these local institutions are stronger that we can generate the people's participation that is needed for effective implementation expect sustained impacts of flagship programmes, including careful maintenance and upkeep of assets created and funds saved.

15.8 Implementation and monitoring of government schemes can be greatly strengthened through creative use of ICT. Extension of broad band connectivity to all Panchayats would enable much better information flow and allow stronger monitoring of the implementation of programmes on the ground.

15.9 The Twelfth Plan can help deal with these problems if specific provision is made in each flagship programme for dedicated time and human and financial resources for local institution development. This has been already done, for example, in the IWMP and is proposed under the NRLM.

Capacity Building

15.10 Implementation of flagship programmes requires professional expertise. Activities such as developing plans, or measuring work, and valuing it according to the Schedule of Rates under MGNREGA/IWMP, or linking women's SHGs to banks and teaching them financial discipline and accountability under NRLM, or spreading awareness about management of sanitation and water supply schemes, all these activities need professional human resources. As noted above, provision should be made in each programme for recruiting professionals from the open market, following transparent procedures and on the basis of strict norms of accountability and performance. These will be short-time appointments and will not add to the permanent staff burden of the State Government. While the deployment of professionals is critical in the short term, an effort should be made in parallel to develop capacities of local youth, who are potential leaders, and in many ways, are in the best position to perform the crucial and most difficult tasks of social mobilisation.

15.11 We also need to acknowledge that government institutions charged with capacity building (whether NIRD, SIRDs, CAPART, NIPCCD or the WALMIs etc.) have, by and large, not succeeded in their designated role and are in urgent need of reform. They need to be thoroughly professionalised, and also need to develop powerful partnerships with carefully selected civil society organisations.

Partnerships with Civil Society

15.12 Civil society has a crucial note to play in strengthening of local institutions and in bringing innovation into government programmes. Government must strongly encourage

partnerships with civil society including not only NGOs, but also academic institutions, professional associations and universities. The precise institutional arrangements through which can be involved could vary, depending on the requirement and context, but the need for such partnership needs to be emphasised in the design of programmes. They could, be either in-sourcing or out-sourcing types of relationships, so that the synergy of state and civil society can truly be harnessed. Both types of relationships have already been tried out with great success.

The Problem of Central Ministries Acting as Silos

15.13 Many of the areas where we need substantial improvement in outcomes such as health, water management, development of manufacturing etc. require action in several fields. Solutions require collaboration amongst several ministries and departments. Unfortunately, Ministries/Departments typically act as silos. Plans and schemes are developed along the jurisdictional lines of the ministries and departments, based on vertical management and decision system which often makes coordination with other concerned Ministries very difficult. It is necessary in the Twelfth Plan to undertake collaborative strategizing amongst the concerned ministries to clarify the roles of the departments in delivering holistic outcomes from the perspectives of citizens.

15.14 It is clear, for example, that the drinking water, sanitation and housing programmes in the field must be converged into a broader habitat development approach. Past efforts to achieve coordination have not succeeded. Similarly, despite the formulation of Common Guidelines for watershed development and the formulation of the IWMP and its focus on livelihoods, the programme is rarely being integrated with the RKVY or the MGNREGA. With the coming of the NRLM, there is a need for a convergent livelihood focus, building upon the water infrastructure created under MGNREGA and IWMP and the increase in agricultural productivity through RKVY. It is necessary to develop effective mechanisms for alignment/convergence of Central Ministries and Departments on systemic issues and incentivise convergence in each flagship programme with other flagship programmes closely connected to it.

Emphasis on Social Mobilisation

15.15 The experience of many flagship programmes has clearly established the central role of a socially mobilised and aware community as a decisive determinant of success. Programmes such as, for example, the MDMS and ICDS have succeeded wherever women are mobilised and are aware of their rights and responsibilities, whereas elsewhere the same programmes have performed poorly. It is also clear that romanticizing community action and presuming that this

will happen on its own, is only perpetuating a myth that hurts the poor. Local communities, left to themselves will not necessarily allow the poor, *Dalits*, *Adivasis* and women to express their voice. There is need to make a specific provision in each flagship programme for a dedicated time, human and financial resources for social mobilisation, awareness raising and social audit.

Separation of Delivery and Policy Making Functions

15.16 Good governance often requires delivery functions to be separated from policy-making functions in Government Ministries; otherwise both can become less effective. Delivery organizations could be set up as specialized agencies with clear mandates, resources, and accountabilities. They should be professionally managed by people with requisite domain expertise. They should of course be accountable to Ministers. In this way they may be 'attached' to ministries, but should be 'autonomous' from them. The Administrative Reforms Commission has recommended this approach.

15.17 Programmes like MGNREGA, IAY, PMGSY and the rural electrification programme under RGGVY are examples of areas where policy making and implementation needs to be separated to ensure effective implementation. In these areas a Chief Executive could be appointed and mandated to clearly monitor, effectively implement and review these programmes. These functions would be separated from policy making which may be done in the Government. As the Second Administrative Reforms Commission has pointed out this process has expanded rapidly in the last two decades in Britain, Australia and New Zealand with success and we need to introduce this organizational change in our Government system, too.

Learning from both Failure and Success

15.18 While instances of poor performance in flagship schemes receive a great deal of publicity, there are many examples of success that go unnoticed. Every flagship programme must be subject to careful diagnostics and monitoring that facilitates learning from failure as well as success. The process of concurrent evaluation of programmes has not been very successful in most of the flagship schemes has not been very successful in this activity. The Planning Commission should make a special effort to identity success stories and propagate lessons from them.

15.19 In addition to concurrent evaluation, there is need for *ex post* evaluation of programmes, based on rigorous criteria to evaluate impact on final outcomes. For example, concurrent evaluation can tell us whether schools are being built on schedule, or PHCs set up, but whether these interventions have actually had an impact on education and health outcomes can be known only once the system has been in operation for a while. The

Independent Evaluation Office, which is being set up under the aegis of Planning Commission, and will become operational in the current year, would be an important instrument for evaluating some of these programmes. Evidence based evaluation will throw up lessons which can guide the design and implementation of schemes in future.

Tracking of Central and State Releases

15.20 The present accounting system does not permit effective monitoring of the flow of resources from Central Ministries to state governments and ultimately to the implementing agencies. The lack of uniform coding for plan schemes between the Centre and the States makes it difficult to trace releases under a particular scheme from the Centre to the ultimate user as it flows through the state budget system. As a result, the Central Government has direct information on releases made but no online capability of tracking flow of funds through the State implementing agencies. Actual expenditure incurred in the field cannot be tracked online and is only known on the basis of "utilisation certificates" which take a great deal of time before they are submitted.

15.21 A new multi-dimensional budget and accounting classification being prepared by a Committee set up by the Ministry of Finance aims at correcting these weaknesses. The Central Plan Scheme Monitoring System (CPSMS) has been initiated by the Controller General of Accounts, in collaboration with the Planning Commission, to serve as a comprehensive management information and decision support system. CPSMS seeks to have interface with state treasuries and State AGs to obtain real time expenditure information for schemes for which funds are transferred from the Central Ministries to the consolidated fund of the states. Thousands of implementing agencies are proposed to be integrated through Core Banking Solution (CBS) of the individual banks so that fund movement is tracked at each successive stage starting with the initial release from the Centre till the money actually reaches the ultimate beneficiaries.

15.22 When fully implemented, the CPSMS will provide online information of fund deployment and utilization vertically under each scheme down to the implementing agencies in the field and also horizontally across schemes in one geographic area. Inputs provided by the system would be vital for programme management and policy planning. The information on fund utilization could also be placed in the public domain for greater public awareness, public participation in the policy making and execution and toward enhanced transparency in Government operations.

15.23 As mentioned above, many schemes involve transfer of funds to societies which are the implementing agencies. These societies must be brought under the discipline of CPSMS. They must also be made subject to CAG audit, which can be done if it is built into the guidelines of the scheme.

Good Governance in General

15.24 Going beyond the issue of implementing government programmes, it is necessary to recognise that good governance is also necessary for the effective functioning of our economy. Good governance in this context refers to an entire range of issues including the ease with which ordinary citizens can access government services, functioning of the rule of law, control over corruption, etc. It is important to recognise that there is no magic wand in the form of a single intervention that will achieve results in all these dimensions. We have to operate on many fronts.

15.25 Many steps have already been taken to improve citizen-government interface through e-Governance, which has introduced greater transparency in a range of areas such as for example, e-booking of rail tickets, e-filing of tax returns with electronic refunds, obtaining birth and death certificates, land registration, etc. online. The Second Administrative Reforms Commission had given 15 Reports, out of which 13 have been examined and most of the recommendations contained in these have been accepted and are under implementation. Some of the measures, which are at various stages of processing, include draft Integrity Pact, the Benami Transaction Bill, the Bill for Protection of Whistle Blowers, development of e-governance initiatives and the Electronic Service Delivery Bill. However, much remains to be done and some of the key areas for action are discussed below:

Rule of Law

15.26 Our Constitution has prescribed powers for the executive, legislature and judiciary and all three wings of government operate in an environment where there is a strong Press, functioning with full freedom of expression guaranteed under the Fundamental Rights of the Constitution and also a watchful civil society. Both the Press and civil society are now empowered by the Right to Information. This introduced unprecedented transparency which has helped our democracy to gain strength and resilience. However, public perceptions suggest that each of the three wings of government – executive, legislature and the judiciary –have to do more to be able to function better, in accordance with the Constitutional provisions, which in turn would give citizens the confidence that we live in a society adhering to the principle of Rule of Law.

15.27 Effective police reforms are an important step in strengthening confidence in the Rule of Law. The number of police personnel per thousand population in India is one of the lowest in the world and the police are also inadequately equipped and organised. The effectiveness of policing is greatly hampered by the absence of modern communications and independence of functioning. Reforms for independent functioning of the police initiated as a result of Supreme Court directive, but they have moved very slowly. The separation of the investigation wing from the normal police force has been implemented only in very few States. Registration of crimes by ordinary citizens is often impeded by the desire of the police to show a good performance. The investigative wings have also lacked adequate forensic support. These are areas in which additional investments are required, along with modernisation of processes and use of e-governance.

15.28 The accumulation of Court cases is a major weakness in the system which erodes confidence in the rule of law. Delay in trials has led to extremely poor conviction rates and a huge backlog of cases. Under IPC Sections alone, there were 81 lakh cases pending in 2009 and the number is increasing every year with the introduction of new cases exceeding the annual disposal. Unless the guilty are afraid that punishment will be meted out fast and investigations will be fair, the Rule of Law cannot prevail. Effective administration of criminal justice requires expansion of courts, innovative ways for early trial and settlement of cases, need for effective alternative dispute resolution mechanism, and other reforms in the judicial system. It may also require new laws which can result in a speedy trial of cases. It is important to note that judicial delays hurt the innocent the most. Not only is justice denied if it is delayed, but the process of a prolonged trial typically devastates those who are actually innocent, while it does not actually worry those who are guilty.

The Problem of Corruption

15.29 Corruption surfaces in many forms, all of which erode the confidence of the citizen in the quality of governance. They range from petty corruption associated with getting permissions that should be routinely available, large scale corruption associated with faulty procedures for handing large contracts and also corruption arising from discretionary decision making. These problems are not unique to India, nor are they only of recent origin. However, public perception of corruption as a pervasive problem has increased. This is in part because of greater awareness and increased transparency (e.g., the Right to Information Act) and also the operation of a vigilant Press, especially the electronic media. Whatever the reasons, there can be no dispute that the problem requires focussed attention in the Twelfth Plan.

15.30 The view that economic reforms have bred corruption is not correct. Many reforms, such as the abolition of industrial licensing and import licensing have actually ended corruption in areas where it was earlier widely prevalent. However, rapid economic growth has meant sharp increase in the value of many scarce resources, e.g., minerals, or spectrum or land and as long as these are allocated on the basis of discretion exercised in a non-transparent manner, the likelihood of corruption increases. It is the lack of reforms in these areas to reflect the needs of the situation that is the real source of the problem.

15.31 The prevalence of corruption is reflected in the fact that the Transparency International Corruption Perceptions Index 2010 shows India with an index value of 3.3 at 87th position out of 178 countries in ascending order of corruption. It is interesting to note that there has been a marginal improvement in the India's corruption Index over the past 10 years, with India being reclassified from the top quartile of the countries suffering from corruption to somewhere nearer the middle, but this is not a development from which we should take any comfort. Corruption is far too prevalent and it is imposing economic costs and is also strongly resented by growing number of citizens. It needs to be tackled urgently.

Multi-faceted Approach to Deal with Corruption

15.32 To address corruption we must act on several fronts. We must aim at preventing corruption through further simplification of procedures for delivery of public services, and introducing greater transparency in public procurement processes and allocation of scarce resources. We must also strengthen mechanisms for dealing with corruption after it occurs through institutions such as the Lokpal and Lokayuktas.

15.33 The Government is currently considering ways of reducing discretion in the system. It is necessary to ensure that the allocation of scarce natural resources e.g., minerals, land, spectrum, etc., takes place on the basis of a transparent non-discretionary system through competitive auctions or through well laid out regulatory systems, and giving equal opportunity to everyone. Corruption associated with government contracts can be minimised by restructuring government procurement processes. An Expert Committee has recommended enactment of a National Public Procurement Act in line with international practice in many countries. UNCITRAL has recently published a new model Public Procurement Law, replacing its earlier model law published in 1994. The Government has announced its intention to put a suitable law in place along these lines as soon as possible.

15.34 Corruption in the interface between the *aam aadmi* and the government is a common source of public unhappiness. It is vital that systems for delivery of public services should be made citizen-friendly and time-bound. This requires reforms in the implementing agencies,

including in the State Governments where most of the public services are delivered at the grassroots level. Information and Communication Technology (ICT) can play a major role in achieving these results. A citizen's charter which lays down the quality standards in delivery of services will help greatly.

15.35 Perceptions of public services and quality of governance can be measured and evaluated by independent institutions in terms of citizens' report cards or social audits through surveys focussing on levels of satisfaction from public services as perceived by citizens. Such surveys reveal the areas where people have felt relatively satisfied and those where they felt great need for improvement. An analysis of levels of public satisfaction and reasons thereof would be extremely useful if done concurrently as programmes get implemented. It would be important to identify organizations both at the Central and State levels to undertake these activities. Civil society and other independent agencies can be charged with this responsibility.

15.36 While the various measures enumerated above will help reduce the likelihood of corruption, they need to be supplemented by creating stronger mechanisms for investigating and punishing those found to be involved in corrupt practices. The establishment of new institutions like the Lokpal and Lokayukta, which are adequately empowered to investigate complaints of corruption, and to file cases against those against whom a *prima facie* case is made out, is an important initiative. Specific proposals are currently under consideration in Parliament. Such institutions could be supported by special courts who must take quick decisions on cases of corruption, so that effective and quick punishment is meted out quickly and acts as deterrent. It is important that these new institutions should function independently, fairly and also be themselves accountable.

Electoral Reforms

15.37 Electoral reforms are another area which needs attention. The Election Commission is one of the institutions in the country that has gained wide respect for conducting fair elections which do lead to changes in government. However there is need for further improvement. Apart from funding of elections, development of healthy electoral practices by which citizens with low financial means are also able to participate in the elections fairly is important part of the political process. There is need for stronger participation of women legislators. Measures to strengthen electoral process will need to be taken and a law passed to support this along with Model Code.

Public Private Partnerships and Regulatory Reform

15.38 As pointed out elsewhere in this paper, rapid growth calls for larger investments in infrastructure and the limitations of public resources have led to greater reliance on private

investment through various forms of PPP. Considerable progress has been made with PPPs in Power, Roads, Ports, Airports and Railways. Such projects may now also have to be taken up in other areas like education and health. Resort to PPPs raises new issues of governance, both in traditional infrastructure areas and also in new areas. We have to ensure PPPs deliver the desired end result, i.e., improved quality of services to the people at a reasonable price. This obviously depends on the quality of the concession agreements and other contractual agreements governing performance under these PPPs.

15.39 The experience with certain cases of private partnerships in infrastructure have shown that problems can arise in the course of operation, and not enough thought was given to anticipate these problems and determine how they will be handled. Similarly in the area of health, there are many cases where the promised provision of services for the poor has not been realised. Such failures can be avoided by ensuring that the legal arrangements under which PPPs are implemented specify clearly what is expected in terms of delivery of services, with mechanisms to enforce obligations and also punish violations if necessary.

15.40 It is also necessary to ensure that that the private parties involved in PPP projects are chosen in a completely transparent manner and not in a manner which can be criticised as giving particular individuals undue advantage. Wherever possible a strongly competitive process is to be recommended. Allocation of PPP concessions on the basis of competitive offers allays suspicions. Where competition is not feasible, the method of choosing the partner must be highly transparent. It may also be necessary to take up process audit in some of the major projects to ensure compliance with the notified procedures.

15.41 The adoption of private investment in many regulated sectors has been accompanied by a growth of regulatory institutions to perform roles which were earlier performed by government. Shifting government functions to regulatory agencies has merit and is in line with international practices. However, it is important to ensure that the regulators are truly independent and technically capable of performing their functions. They should also be more accountable since the areas of private investment are going to expand in the coming years and regulatory capture is a well-known danger. There is a case for considering an overarching framework law governing the functioning of independent regulators in different sectors other than the financial sector. The need for legislation in this area has been discussed extensively and draft legislation should be prepared for wider discussion.

Institutional Mechanisms of Conflict Resolution

15.42 A major new worry on India's development landscape is the increasingly intense conflict over land and water. This appears to cloud the very possibility of inclusive growth by setting up seemingly irreconcilable differences across stakeholders. Given that 90 per cent of our coal, more than 50 per cent of most minerals and most prospective dam sites are in tribal regions, there is likely to be even more contention over issues of land acquisition in areas inhabited by some of our most deprived people. We need an institutionalised (rather than the current somewhat *ad hoc*) approach that would help mitigate conflicts before they reach a point of no return by working with stakeholders to resolve grievances using a flexible problem-solving approach and creating win-win scenarios for all stakeholders concerned. This requires specialists trained in alternative dispute resolution, with expertise in conflict assessment, management, mediation and facilitation.

15.43 To summarise, improvement in governance in all these dimensions must be made a central focus of the Twelfth Plan. This has implications for both the Central Government and the States. The problem is multi-dimensional and complex, and there are no perfect solutions. But a sincere effort across a broad range can produce visible results within a few years. Improvements in governance would be seen as a major gain for the ordinary citizen and would also contribute enormously to the investment climate and therefore to GDP growth.

16

Innovation

16.1 The role of innovation in spurring growth, overcoming natural resource constraints and unleashing Indian energies and synergies is widely recognised all over the world. Recognizing the importance of innovation, the President of India has declared this decade as the 'decade of innovation', with a focus on inclusive growth.

16.2 Innovation is already contributing significantly to the growth of the economy and dynamism of industry. Indian entrepreneurs are developing novel solutions for the needs of Indian consumers that provide access to services and products at a fraction of the cost of the solutions available from industrially advanced countries. Examples of such innovations are the delivery models of mobile telephony services that have expanded the reach of telephony with the cheapest call services in the world; extremely low cost eye surgeries which do not compromise on surgical standards at US $ 50 compared to US $ 1650 in the US. Other examples of affordable innovation are : a vaccine for hepatitis B at a thirtieth of the cost of earlier products, a peoples car for less than US $ 2,500; an innovative refrigerator using thermo-electric cooling at a price less than US % 75, a water purifier combining nano-technology and rice husks to provide safe drinking water for a family of 5 at US $ 0.02 per day; a solar lighting system for rural houses at US $ 200 and a solar powered ATM machine that has just 4 percent of the total energy requirement of conventional ATMs.

16.3 Three distinctions of the emerging Indian approach to innovation are worth noting. Firstly, it focuses on finding affordable solutions for the needs of people – for health, water, transport, etc. – without compromising quality. Secondly, in this Indian approach to innovation, desired outcomes are produced by innovations in organizational and process models that deliver to people the benefits of technologies that may be developed in scientific laboratories. Thirdly, there are innovations in the process of innovation itself to reduce the cost of developing the innovations. An example is the open source drug discovery process being

applied by the CSIR to develop drugs for treatment of tuberculosis, based on a semantic-search, web-based platform for collaboration developed by Infosys, an innovative approach that has cut down the costs and reduced the time for drug development.

16.4 This new paradigm of innovation, focused on producing 'frugal' cost solutions with 'frugal' costs of innovation, in which India may be emerging as a global leader, contrasts sharply with the conventional approach, mostly focused on increasing inputs of Science and Technology and R&D and measurement of the numbers of papers and patents produced. Frugal innovation is focused on the efficiency of innovation and on outcomes that benefit people, especially the poor. Industrially advanced countries too are examining their innovation policies to incorporate this broader concept of innovation. For instance, Sweden, ranked as the second most innovative nation in the world in terms of traditional inputs of Science &Technology and R&D per capita, is formulating a National Innovation Strategy that is focused on using innovation for not only enhancing growth and competitiveness of its industries, but also for addressing global challenges of inclusion, and for improving the delivering of its public services. Its national strategy broadens the scope of innovation to go beyond products to processes, services and new business models. Similarly, UK has also placed all types of innovation at the heart of its strategy to drive future growth and the country's vision. Its strategy also highlights the need for Government policy to recognize the changing face of innovation. Thus the metrics of 'innovation' are shifting from an inputs oriented paradigm focused on R&D investments and patents, towards an output oriented system that looks at impact in terms of benefits for people.

16.5 Conversion of R&D to results for people requires an ecosystem of enterprises working in conjunction: entrepreneurs, researchers, finance providers, business enterprises, and policy-makers. Therefore the national strategies for innovation, such as those of Sweden and UK cited before, focus on the need for various types of institutions in the eco-system and for more effective collaboration amongst them. This must be India's agenda too if India is to accelerate inclusive growth through innovation.

Role of Government

16.6 Government has a critical role to play in strengthening the innovation eco-system. It must provide the enabling policy interventions, strengthen knowledge infrastructure, create markets for innovations through the stimulus of Government procurement, improve inter-institutional collaborations, provide a mechanism for funding business innovations at all levels especially SMEs, and provide vision through a national level roadmap for innovations. To spur the Indian innovation eco-system the Prime Minister has set up a National Innovation Council

(NInC) with the mandate to formulate a Roadmap for Innovations for 2010-2020 with a focus on inclusive growth. Principal initiatives already undertaken by the Council and some other innovative programs of the Government are mentioned here.

Collaborations and Clusters

16.7 Since innovation generally results from combinations of capabilities, collaborations and clusters have been globally found to be effective means for producing more innovations, and results from innovations. 'Clusters' can be physically co-located enterprises or 'virtual clusters' of enterprises connected through technology, or often a combination of both. In India the bio-technology industry is coalescing in several innovation clusters, combining research establishments and producers, the results from which are appearing. Several other clusters of industries—engineering products, garments, pharmaceuticals, leather goods, etc.—are operating around the country. NInC has outlined a partnership agreement with CSIR to connect the resources of CSIR with such clusters to promote innovation in them. NInC is also rolling out a 'cluster tool-kit' with guidelines and best practices for improving cluster performance. The Open Source Drug Discovery process, mentioned before, is a remarkable example of a virtual cluster formed by technology enabled 'crowd sourcing' of collaborators converging to respond to an innovation challenge. Such an Open Innovation Model, using an "open source" and collaborative approach, can enable creation of affordable solutions which would not be likely with a conventional, "in-lab" approach.

Supportive Financial System and Mentoring

16.8 There is no dearth of ideas in India. The 'Honey Bee Network' and the National Innovation Foundation have documented over a hundred thousand already, and only from 'grass root innovators'. Innovators need financial support at an early stage to develop and test their ideas in the market-place. Venture funds are recognised globally as the most suitable form of providing risk capital for the growth of innovative technology and breakthrough ideas. While India is amongst the top recipients in Asia for venture funds and Private Equity Funds, these investments are so far focused on relatively large and 'safer' investments. Thus, despite the growth in the venture capital industry in India and some government schemes for supporting entrepreneurs, the seed funding stage in the innovation pipe-line, where amounts required may be small but risks high, is severely constricted.

16.9 To plug this vital gap in the innovation eco-system, the National Innovation Council is considering the need for a professionally managed *India Inclusive Innovation Fund* which will invest in innovative enterprises engaged in providing solutions for the 'bottom of the pyramid'. It will focus on innovations that will produce socially useful outcomes for poorer people and

enterprises which are focused on delivering these. The Fund will also provide support for mentoring entrepreneurs to build their enterprises and achieve desired outcomes. The Fund will be built upon seed capital from the Government multiplied by contributions from various Indian public sector enterprises, banks, private investors, corporates and investment firms. Several international funds whose mission is to support social entrepreneurship have expressed interest in participating in such a Fund if it were sponsored by the Indian Government. The structure of the Fund and its governance is now being designed.

Innovative Enterprise Development

16.10 Affordable and accessible products and services of good quality must be the primary outcome of the country's 'frugal innovation' thrust. Experience of successful innovations, such as the low cost eye and heart surgery models, as well in the micro-finance industry, shows that the employment of the country's low cost pool of skill-able people in the production and distribution of the products and services is a key to enabling their affordability and accessibility. Such innovative models also increase opportunities for increasing employment and improving the lives of the people who are part of the production and distribution process.

16.11 Enterprises owned by the producers enable the producers to not only earn incomes but also share in the wealth created by the enterprise. Organizations like SEWA, and companies formed by the *chanderi* weavers in Madhya Pradesh, are such examples. Such enterprises require innovations in organizational and legal forms. The Planning Commission is examining changes that would facilitate the multiplication of more such enterprises. Through such innovations, businesses that are of the people (owned by them), and businesses by the people (in which people are a principal resource in production and distribution) can cost-effectively produce products and services for people at the bottom of the pyramid. Such innovative models of businesses can also very competitively produce products for the top of the pyramid and exports too, as do the *chanderi* weavers in Madhya Pradesh and the carpet weavers in a similar, inclusive form of enterprise in Rajasthan.

Platform for Best Practices and Innovations

16.12 Currently, there are many enterprises across the country which are delivering benefits to citizens and meeting challenges of inclusion in areas such as health, education energy, low-cost housing, sanitation, through innovative solutions. It is often said that India is a country with many successful experiments that do not achieve scale. Scaling up the impact of such innovations requires that such ideas be spread around rapidly so that others could emulate them. And it also requires that larger business organizations and venture funds become aware of them and support them. Therefore the strengthening of the innovation eco-system requires

a platform for information sharing and dissemination. While some knowledge portals for innovations in specific areas already exist, the National Innovation Council is in the process of building an India Innovation Portal to enable easy access to these as well as to become a wider information repository on innovation and a platform for collaboration as well.

Intellectual Property Rights

16.13 Management of Intellectual Property Rights (IPR) has become extremely important in the new knowledge economy with global competition. Adequate rights on the intellectual property produced by an innovator enable innovators to recoup their investments and make profits: thus IPR spurs innovation. Good national IPR systems also enable knowledge of technological advances to be accessible through the patent system to others who can build on them. To obtain both these benefits, India must improve its management of IPR. The administrative machinery for IPR management must be considerably strengthened and professionalized and DIPP has taken up this task.

16.14 Holders of IPR have incentives to strengthen and extend their monopolies. However, monopolies can restrain competition and further innovation, and thus tend to increase costs for customers. This is the fear even in the West, with respect to pharmaceuticals for example. The concept of monopolizing knowledge albeit for a limited period, that underlies prevalent models of IPR can have perverse effects when it is extended to areas of traditional knowledge, preventing poorer people from continuing to use their own knowledge without payments to those who have 'patented' it under IPR. Also new models of collaborative innovation are emerging, such as Open Source Drug Discovery, mentioned before. Concepts of IPR will have to be developed to suit such new models of innovation in which, incidentally, India has great stakes because of their potential to produce 'frugal' innovations for inclusive growth. Therefore, as India aims to become amongst the global leaders in innovation, it will also have to be amongst the leaders in efficient management of IPR and innovations in IPR concepts and policies.

Innovations in Government

16.15 Innovations should also be encouraged within Government structures and processes to enable improved service delivery and create more transparency and accountability in the system. The *Aadhaar* or Unique Identity Programme which will create a foundation for more transparent and efficient public service delivery is internationally considered as a game-changing approach to inclusion. By providing a clear proof of identity, *Aadhaar* will empower India's poorer citizens in accessing services such as the formal banking system and give them

the opportunity to easily avail various other services provided by the Government and the private sector.

16.16 Government is also leveraging ICT to reduce pendency in the legal system, encourage a move towards e-governance, e-procurement and e-tendering. It is also undertaking an ambitious initiative to connect 250,000 *Panchayats* with fiber-based broadband to improve governance and service delivery at the last mile. GIS mapping will also be applied more extensively to improve land record management and delivery of services in urban and rural areas

16.17 Other innovations are in the management of performance of government ministries. The Government has initiated a performance management system which requires every ministry and department to undertake a stakeholder consultation to assess the gaps between its' stakeholders' expectations and its actual delivery. Ministries must develop innovative strategies to bridge these gaps, and must accordingly specify the measures of its performance by which it should be judged. After initial trial runs and adjustments in its design, this system, generally called the Results Framework Document (RFD), is now adopted by almost all ministries at the centre. Some State governments have also begun to adopt this approach.

16.18 An extensive innovation ecosystem requires many lateral connections, often at local levels, between producers, sellers, and financiers, and the facilitating government machinery. Sweden has a region-wise process of participation of citizens and enterprises in formulating the innovation agenda. In a much larger and more diverse country, as India is, development of the innovation eco-system must be even more widely devolved. Therefore NInC is encouraging the States to set up State Innovation Councils to stimulate the eco-systems for innovation in their states. Currently, 13 State Government have constituted State Innovation Councils. Using the broad templates suggested by NIC they will develop interventions to suit their state's specific needs. In this way the national Innovation agenda will combine with other thrusts for improvement of governance and service delivery described elsewhere in the Approach to introduce more flexibility and innovation in centrally sponsored schemes and thus improve the efficiency and inclusiveness of the growth process.

Information and Communication Technology

16.19 Innovative programmes and policies are required at the Centre as well as in the States for ICT to permeate rapidly in the country and enable India to achieve its goal of more inclusive and faster growth. The country must provide affordable and accessible education, skill development, healthcare, and financial services, very rapidly and on a very large scale...

Moreover, citizens are demanding improvement of governance with greater efficiency in delivery of public service and greater transparency. Information and Communication Technologies (ICT) can enable the improvements and innovations necessary for providing affordable and accessible social sector services. The expansion of Aadhar numbers through the UIDAI, and the associated opening of bank accounts, which can be accessed remotely opens up the possibility of transferring benefits to the beneficiaries directly. Pilot programme to apply this to kerosene, LPG and fertiliser are being designed. If successful, the experiment can be extended to the PDS. This will require improvement of connectivity and bringing broadband services to India's villages. The development of innovative service delivery and business models will also be necessary. Indian capabilities in the software industry are recognised around the world. However these capabilities have not been vigorously applied to domestic opportunities so far. Moreover, the large opportunity for expansion of ICT services in India should attract foreign technological capabilities. The Twelfth Plan must stimulate widespread deployment of ICT in the country to accelerate inclusive growth.