



An Institute for Civil Services

GIST OF REPORT PERFORMANCE OF THE NATIONAL ACTION PLAN ON CLIMATE CHANGE (NAPCC)

**Gist of Committee on Estimates
Report, 2018-19**

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PERFORMANCE OF THE NATIONAL ACTION PLAN ON CLIMATE CHANGE (NAPCC)

GIST OF COMMITTEE ON ESTIMATES REPORT, 2018-19

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1

INTRODUCTORY

- Climate change poses a major threat to the world today in view of its far-reaching implications for environment, agriculture, water availability, natural resources, ecosystem, biodiversity, economy and social well-being.

Climate Change is defined as:

- Intergovernmental Panel on Climate Change (IPCC) refers to any change in climate over time, whether due to natural variability or as a result of human activity.
- United Nations Framework Convention on Climate Change (UNFCCC) refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods.
- On simple words, climate change can be defined as increase in the average global temperature of the earth

- In 1990, IPCC brought out its first Assessment Report which concluded that temperatures have risen by 0.3-0.6°C over the last century.
- In 1992, the Earth Summit was held in Rio de Janeiro where the assessment of IPCC was agreed to. Its key objective is "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system". Developed countries agreed to return their emissions to 1990 levels.
- In 2015, Conference of Parties (COP21) was held in Paris where all participating countries came together to fight the menace.

- In 1975, the "global warming" was first inserted into the public domain which can be taken as the starting point for discussion on climate change.
- In 1988, IPCC was formed to collate and assess evidence on climate change.

- In order to address the growing threat caused by the climate change, the Government has launched the National Action Plan on Climate Change (NAPCC) in June 2008 to achieve its goals and to deal with the issues related to climate change.
- NAPCC comprises the eight missions. Each mission is anchored under a Ministry, which is responsible for its implementation and lays down the budget provisions and actionable priorities for it. Ministry of Environment, Forest and Climate Change (MoEF&CC) is the coordinating Ministry of NAPCC.

<ul style="list-style-type: none"> Missions under NAPCC 	<ul style="list-style-type: none"> National Solar Mission National Mission on Enhanced Energy Efficiency National Water Mission National Mission for a Green India National Mission on Sustainable Habitat National Mission for Sustainable Agriculture National Mission for Sustaining the Himalayan Ecosystem National Mission on Strategic Knowledge for Climate Change
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NATIONAL SOLAR MISSION

- Jawaharlal Nehru National Solar Mission or the National Solar Mission (NSM) was launched on 11th January, 2010 with the objective of increasing the share of solar energy in the total energy mix through development of new solar technologies, while attempting to expand the scope of other renewable and non-fossil options such as nuclear energy, wind energy and biomass. NSM is being implemented by the Ministry of New and Renewable Energy (MNRE).
- The Government has set the target of Grid-Connected Solar Power Projects to 100,000 MW by the year 2021-22 under the NSM. The total investment in setting up 100 GW will be around Rs. 6,00,000 crore.

NSM has adopted a three-phase approach:

- Phase-I (2010-2013) was designed to focus on capturing the low-hanging options in solar thermal, promoting off-grid systems to serve populations without access to commercial energy and modest capacity addition in grid-based systems.
- Phase-II (2013-2017) was aimed to capacity addition with a rapid pace.
- Phase-III (2017-2022) is being implemented to create conditions for scaled-up and competitive solar energy penetration in the country.

Key Achievements:

- MNRE in a note stated that 9012.66 MW of grid-connected solar generation capacity and 382.01 MW equivalent of off-grid solar generation capacity have been installed.

◦ A total of 25,210 MW of solar energy capacity has been installed in the country as on 31/12/2018: PIB, February 12, 2019

- As per the written note furnished by MNRE, as one of the mission objectives, India is to take a global leadership role in solar manufacturing (across the value chain) of cutting edge solar technologies and target a 4-5 GW equivalent of installed capacity by 2020. India already has photovoltaic (PV) module manufacturing capacity of about 700 MW, which is expected to increase in the next few years. The present indigenous capacity to manufacture silicon is very low, however, some plants are likely to be set up soon in public and private sector. Currently, there is no indigenous capacity/capability for solar thermal power projects; therefore, new facilities will be required to manufacture concentrator collectors, receivers and other components to meet the demand for solar thermal power plants. The import from China in solar products are very high. India imported a third of China's solar shipments between the months of January to September, 2017.
- The Phase-I of NSM generated a huge interest in the solar sector wherein grid connected and off-grid projects were commissioned throughout the country. Achievements of Phase-I exceeded the targets set for the period. This momentum has been carried forward to the next phase, i.e. Phase-II.

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NATIONAL MISSION FOR ENHANCED ENERGY EFFICIENCY

◦ The National Mission for Enhanced Energy Efficiency (NMEEE) is one of the eight missions of the National Action Plan on Climate Change (NAPCC). The nodal Ministry is the Ministry of Power (MoP). As per MoP, NMEEE aims to strengthen the market for energy efficiency by creating conducive regulatory and policy regime and has envisaged fostering innovative and sustainable business models to the energy efficiency sector.

NMEEE spelt out four initiatives to enhance energy efficiency in energy intensive industries:

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

Key Achievements:

◦ On being asked about the estimates of the amount of CO2 emission reduced so far due to PAT scheme, MoP in a written reply has stated as

under: "At the end of PAT cycle I in March, 2015, energy savings of 8.67 mtoe which is equivalent to around 30 million tonnes of CO2 mitigation was achieved. Further, it may be noted that energy saving target of 8.76 mtoe for PAT cycle II will be achieved by 2019. Till date, it is expected a total of 10.49 mtoe energy savings would be achieved which corresponds to avoiding emission of 52.45 million tonnes of CO2."

- When asked about the details of monetary savings made so far due to the above schemes and efforts, MoP in a written reply has stated as under: "It may be noted that the weighted average price of 1 mtoe is ₹10,968 at 2014-15 price of the basket of fuels used by the PAT sectors. Therefore, considering the total savings of 10.49 mtoe, this savings in monetary terms till date comes to around ₹11,483 crores."
- **Super-Efficient Equipment Programme (SEEP):** As per a note furnished by MoP, SEEP is a program designed to bring market transformation for super-efficient appliances by providing financial stimulus innovatively at critical points of intervention. Under this program, ceiling fan has been identified as the first appliance to be adopted. The goal is to support the introduction and deployment of super-efficient 35 W ceiling fans, as against the current average ceiling fan sold in Indian market with about 70 W rating. Super-Efficient Equipment Program for ceiling fans is being revisited in light of the demand aggregation model for LEDs. SEEP for other appliances such as refrigerators, air conditioners etc. are being explored for future coverage under the programme.

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NATIONAL WATER MISSION

- According to the Ministry of Water Resources, River Development & Ganga Rejuvenation (MoWR, RD&GR), the implementing Ministry of National Water Mission (NWM), the main objective of NWM is “conservation of water, minimizing wastage and ensuring its more equitable distribution both across and within States through integrated water resources development and management”.

The five identified goals of the Mission are:

- Comprehensive water database in public domain and assessment of impact of climate change on water resource.
- Promotion of citizen and state action for water conservation, augmentation and preservation.
- Focused attention to vulnerable areas including over-exploited areas.
- Increasing water use efficiency by 20%.
- Promotion of basin level integrated water resources management.

For achieving the objectives of NWM, long-term sustained efforts both in terms of time-bound completion of identified activities and ensuring the implementation of identified policies and enactment of necessary legislation through persuasion at different levels with the State Governments have been envisaged.

- India constitutes 2.45% of world’s land area with a population of 17.5% of the world.
- India has 4% of World’s Renewable Water Resources with water availability 1545 cubic metre/per person/year.
- There is a water scarcity of 1000 cubic metre/person/year

Steps taken so far:

- As for establishment of Hydrological Observation Stations and Satellite-based Telemetry, it has been informed that for Hydrological Observation Stations, 702 such stations have been established in the XII Plan period and as for Automatic Satellite based Telemetry system, 65 such systems have been established during the same period.
- As per MoWR, RD&GR, aquifer mapping is going on and the target for XII Plan is 0.9 million square km for XII Plan out of 2.3 million km² in the following 8 states: Haryana, Punjab, Rajasthan, Gujarat, Andhra Pradesh, Telangana, Karnataka, Tamil Nadu and Bundelkhand areas of UP/MP.

Some of the achievements under XII Plan period (2012-2017) are as under:

- Mapping of 6.31 lakh sq.km upto March 2017 against a target of 8.89 Lakh sq.km.
- Delineation of Contamination – free aquifers in the Arsenic – affected States of UP, Bihar, Jharkhand & West Bengal.
- Mega Recharge Project in Tapi River basin, developed based on Aquifer Mapping studies evaluated and approved by the Task Force.
- In drought affected areas of Latur district, 25 wells constructed on sites identified during May & June, 2016 for tackling drinking water crisis.
- For improving water use efficiency, a scoping study has been done for the Major-Medium Irrigation Projects and has been completed in association with Asian Development Bank (ADB). Moreover, two Pilot projects at Sanjay Sarovar at Madhya Pradesh and and Dharoi Project at Gujarat.

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NATIONAL MISSION FOR A GREEN INDIA

- The National Mission for a Green India or Green India Mission (GIM) is one of the eight Missions outlined under NAPCC. As per the note furnished by MoEF&CC, GIM aims to both increasing the forest and tree cover as well as increasing the quality of the existing forest cover. The Scheme was proposed for a period of 10 years.

Broad objectives of GIM as per MoEF&CC are as under:

- To increase forest/tree cover to the extent of 5 million hectares (mha) and improve quality of forest/tree cover on another 5 mha of forest/non-forest lands.
- To improve/enhance ecosystem services like carbon sequestration and storage (in forests and other ecosystems), hydrological services and biodiversity; along with provisioning services like fuel, fodder, and timber and non-timber forest produces (NTFPs).
- To increase forest-based livelihood income of about 3 million households.

Mitigation Activities undertaken so far and their Outcomes/Outputs

- In the Preparatory Phase of Green India Mission (GIM) and prior to approval of CCEA, funds to the tune of Rs. 62.60 crores were released in FY 2011-

12 & 2013-14 to 27 States/UTs for undertaking preparatory activities which included institutional strengthening, training, identification of landscapes and preparation of Perspective Plans.

- Convergence Guidelines of GIM with Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and Compensatory Afforestation Fund Management and Planning Authority (CAMPA) were issued in March and May, 2015 respectively.
- The National Executive Committee has approved the Perspective Plan and Annual Plan of Operations (APOs) of ten States namely Uttarakhand, Punjab, Karnataka, Chhattisgarh, Odisha, Mizoram, Manipur, Jharkhand, Andhra Pradesh and Kerala. Funds have been released to only nine States except Jharkhand.
- As per MoEF&CC, the sanction of funds under the Scheme is started from 2015- 16 and so far 67651.4 ha physical targets have been sanctioned. But only 43383.8 ha physical target achieved.
- As per information supplied by the MoEF&CC, physical target of 51387.72 hectare area will be afforested in the year 2016-17. Only 41266.12 hectare area could be covered.

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NATIONAL MISSION ON SUSTAINABLE HABITAT

- The National Mission on Sustainable Habitat (NMSH) is one of the eight missions of NAPCC and was approved by the Prime Minister's Council for Climate Change in June 2010. NMSH is being implemented by the Ministry of Housing and Urban Affairs (MoHUA). NMSH aims at promoting sustainability of habitats through improvements in energy efficiency in buildings, urban planning, improved management of solid and liquid waste including recycling and power generation, modal shift towards public transport and conservation.

Mission Targets

- Development of sustainable habitat standards that lead to robust development strategies while simultaneously addressing climate change related concerns;
- Preparation of city development plans that comprehensively address adaptation and mitigation concerns;
- Preparation of comprehensive mobility plans that enable cities to undertake long-term, energy-efficient and cost-effective transport planning; and
- Capacity building for undertaking activities relevant to the Mission.

Journey so far:

- No specific funds have been allocated or are sought for the Mission on Sustainable Habitat, which is being implemented through the four flagship missions/programmes of the MoHUA, which are:
 - ▶ Atal Mission on Rejuvenation and Urban Transformation (AMRUT)
 - ▶ Swachh Bharat Mission
 - ▶ Smart Cities Mission
 - ▶ Urban Transport Programme.
- Successful implementation of the above flagship missions has a potential for mitigation of GHG emission amounting to 133 Million Tonnes CO₂eq. by 2021 and 270 Million Tonnes by year 2031.
- At present, metro rail is being implemented in 13 cities of India. 515 km route length of metro rail line are already operational in Delhi, Bengaluru, Kolkata, Chennai, Jaipur, Kochi, Mumbai, Gurugram, Hyderabad and Lucknow. The Metro rail of approximately 664 km of route length are under construction and metro rail projects of route length of 536 km are under planning stage.

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NATIONAL MISSION FOR SUSTAINABLE AGRICULTURE

- National Mission for Sustainable Agriculture (NMSA) aim at promoting sustainable agriculture through seventeen deliverables focusing on ten key dimensions of Indian agriculture. During XII Five Year Plan, these measure were embedded and mainstreamed on to ongoing/proposed Missions/Programmes/Schemes of Department of Agriculture, Cooperation & Farmers Welfare (DAC&FW) through a process of restructuring and convergence.
- According to the DAC&FW, the strategy in original document had focused on promoting sustainable agriculture through a series of adaptation measures focusing on ten key dimensions encompassing Indian agriculture namely:
 - ▶ Improved crop seeds, livestock and fish cultures
 - ▶ Water Use Efficiency
 - ▶ Pest Management
 - ▶ Improved Farm Practices
 - ▶ Nutrient Management
 - ▶ Agriculture insurance
 - ▶ Credit support
 - ▶ Markets
 - ▶ Access to information
 - ▶ Livelihood diversification

Adaptation Activities and their Outcomes/Outputs

- Under NMSA, during 2012-13 to 2016-17, 18.70 lakh ha area has been brought under the organic farming. Under PKVY, the financial assistance of Rs. 10,000 per acre (or Rs. 25,000 per ha) is given to farmers to support them for moving from inorganic to organic form of cultivation over a period of 3 years.
- Use of biofertilizers reduces dependence on synthetic chemical fertilizers. These may supplement about 25% demand of chemical fertilizer for a specific crop. N₂O gas is mainly

emitted due to use of nitrogenous fertilizers. Increased production of biofertilizers has provided supplementary nutrient source in the form of biofertilizers which are climate friendly, sustainable and cost-effective inputs. Production of biofertilizers is demand based and during 2012-17, annual production of biofertilizers has increased up to 3.96 lakh MT.

- Micro Irrigation System (MIS) delivers water directly to the root zone of crops resulting in improved water use efficiency through reduced loss of water during irrigation and conveyance with a savings in power consumption at the end. During 2012-17, the coverage under MIS is 28.46 lakh ha.
- System of Rice Intensification method of rice cultivation consisting of transplanting 8-12 days old seedling at wider spacing of 25cm×25cm was found superior to traditional transplanted paddy system, standing water, where the field is maintained at saturation thus a saving of water use. The technology is being promoted under National Food Security Mission (NFSM). During 2012-17 the coverage has been reported under SRI is 7.42 lakh ha.
- Crop diversification is another adaptation measure that has been identified as a potential farm-level response to climatic variability and change. Initiated by the government for diverting the paddy area to other crops such as cereals, pulses, agroforestry etc. the programme is gaining momentum. During 2012-17, the coverage under crop diversification is about 2.6 lakh ha. This has led to reduction in water use.
- The horticulture sector encompasses a wide range of crops such as fruits, vegetables, flowers, spices, nuts, etc. of which the fruit crops produce relatively higher biomass and retained in the field for a relatively longer period and thus sequesters carbon both above and below ground parts. Fruit tree plantation absorbs about 1 tonne of Carbon/ha annually. During 2012- 17 alone, area of 8.01 lakh ha has been brought under plantation in arable land which has significantly contributed towards CO₂ sequestration in soils.

- The improved genetic resources could serve resilient genotypes for enhanced CO₂ fixation potential in the soil which will increase the soil organic carbon, thus increasing the soil fertility. Besides, these may have greater adaptation potential against climatic changes/adverse climatic

conditions. Under NICRA, during 2012-17, about 75 genotypes of crop with enhanced CO₂ fixation potential have been identified. Additionally, 73 genotypes with greater adaptation to drought, flood, salinity and high temperature have been identified.



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NATIONAL MISSION FOR SUSTAINING THE HIMALAYAN ECOSYSTEM

- The Himalayan Region is a complex and interrelated ecology of planet earth.
- Its total area is 4.3 million sq km (approx.).
- It has one of the longest, loftiest and dynamic mountain chains on earth, spreading over a length of 2500 km covering eight countries, namely Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal and Pakistan.
- It has the largest bodies of ice outside polar caps measuring 3735 sq km providing eternal ice and snow (3250 cubic km fresh water).
- Himalayan glaciers constitute 17% of global mountain area.
- Nine large Asian river systems originate from the Himalayan Region namely, the Indus, Ganges, Brahmaputra, Irrawaddy, Salween, Mekong, Tarim, Yangtse and Yellow River.
- It is the most populated mountain system in the world having 1.5 billion people who depend on the Himalayas for water, food and energy.

- National Mission for Sustaining the Himalayan Ecosystem (NMSHE) has been implemented with the primary objective to build Science and Technology (S&T) Capacity to address sustenance of Himalayan Ecosystem.
- Ministry of Science & Technology in implementing agency.

Aim and Objective of the mission

- The Mission aims to understand the complex processes affecting Himalayan Ecosystem and evolve suitable management and policy measures for sustaining and safeguarding the Himalayan Ecosystem.
- The crucial and primary objective of the mission is to develop a sustainable national capacity to continuously assess the health status of the

Himalayan ecosystem, enable policy bodies in their policy-formulation functions and assist states in the IHR with their implementation of actions selected for sustainable development to sustain ecological resilience and ensure the continued provisions of key ecosystem services in the Himalayas.

Details of Activities undertaken so far and their Outcomes/Outputs

- **Centre for Himalayan Glaciology (CHG) at Wadia Institute of Himalayan Geology, Dehradun:** CHG is an autonomous institute of Dept of Science & Technology with the broad objective of institutionalizing glaciological research in the country to provide holistic approach to Himalayan glaciology research. Some of the key outcomes of the Centre include the following:
 - ▶ Installation of six Automatic Weather Stations (AWS) in Chorabari, Dokriani and Pindari glacier catchment in the Upper Ganga Valley for real time weather data collection; installation of three Aethlometers in the Bhagirathi Valley to monitor black carbon and aerosols; establishment of Laser Isotope Laboratory to analyse stable isotopes of oxygen and carbon in water and establishment of Remote Sensing and GIS Lab.
 - ▶ Monitoring of 8 glaciers namely Gangotri and Dokriani in Bhagirathi River basin, Chorabari and Companion in Mandakini River basin, Dunagiri and Bagni in Dhauliganga River basin and Pindari & Kafni in Pindar River basin in Uttarakhand region of Central Himalaya.
- **Thematic Task Forces:** As part of NMSHE deliverables, DST has set up 6 Thematic Task forces anchored around lead institutions working in the areas of Himalayan ecosystem. The Task Forces scientifically support the NMSHE objectives to develop in a time bound manner a sustainable national capacity to continuously assess the

health status of the Himalayan ecosystem and enable policy bodies in their policy formulation functions. These Task Forces are leading research institutions working in specific ecosystem areas related to Himalayas. The Task Forces has engaged more than 100 research teams so far from more than 60 research and academic institutions spread across the IHR along with the state governments of the 12 Himalayan states.

- **Inter-University Consortium on “The Himalayan Cryosphere: Science, and Society”:** Four Indian Universities namely Jawaharlal Nehru University, New Delhi; University of Kashmir, Srinagar J & K; University of Jammu, J & K and Sikkim Central University, Gangtok, Sikkim formed a consortium namely Inter-University Consortium on Cryosphere and Climate Change (IUCCCC) to look into Cryosphere-Societal interactions, within the framework of integrated science and social-



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NATIONAL MISSION ON STRATEGIC KNOWLEDGE FOR CLIMATE CHANGE

- The National Mission on Strategic Knowledge for Climate Change (NMSKCC) is one of the eight Missions of NAPCC being implemented by Department of Science & Technology (DST), Ministry of Science and Technology. The mission aims to achieve the following objectives:
 - ▶ Seeks to build a vibrant and dynamic knowledge system that would inform and support national action for responding effectively to the objective of ecologically sustainable development.
 - ▶ Aims at creating institutional capacity for research infrastructure including access to relevant data sets, technologies, computing and communication facilities and awareness to improve the quality and sector-specific scenarios of climate change over the Indian sub-continent.
 - ▶ Seeks to build knowledge and research networks, develop national capacity for modelling the regional impact of climate change on different ecological zones within the country.

Activities undertaken so far:

- Eight Centres of Excellence and 20 Major R&D Programmes
- 10 State Climate Change Centres
- Three National Network Programmes
- Seven Human Capacity Building Programmes
- Eight Global Technology Watch Groups (GTWGs)
- Indo-US Fulbright-Kalam Doctoral and Post-Doctoral Fellowships in Climate Change (annually 6 fellowships)
- The Mission has enabled creating a network of over 125 institutions and 400 scientists to work on climate change related research areas
- Mission supported projects provided new indirect job opportunities to over 250 project personnel during last 3 years
- Strategic knowledge emanating from the mission will be used for formulating national policy and for international level negotiations

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Recommendations

- The Committee on estimates note that the climate change poses a major threat to the world today in view of its far-reaching implications for environment, agriculture, water availability, natural resources, ecosystem, biodiversity, economy and social well-being. As per the series of assessment reports of the United Nations Intergovernmental Panel on Climate Change (IPCC), human influence on the climate system is clear, and recent anthropogenic emissions of green house gases (GHG) are the highest in history.
- The Committee would like to recommend for use of energy efficient appliances in the Government buildings for which LED lights, BEE rated 5-star ACs and ceiling fans should be retrofitted in the existing Government buildings. In the newly constructed buildings, the use of energy efficient appliances should be made mandatory.
- The Committee strongly recommend for working on a mission mode by all the concerned Government Ministries/Departments/Organisations of the Union and State Governments so as to ensure clean water free from all pollutants such as arsenic, fluoride, salinity, heavy metals (Lead, Cadmium, Zinc, Mercury), pesticides, etc. for our large population.

Key Recommendations:

- The Committee recommend to constitute a Mission Mode Authority with Prime Minister to preside and review all the efforts. The Authority should include representatives of all the Missions and provide a holistic approach for resolving the climate issues.
- For inter-Ministerial coordination, the Committee recommend for setting up of an inter-Ministerial entity to quarterly review the performance of each implementing agency.
- MoEF&CC should have a public information portal displaying upto date data/information about mandate, targets as well as achievements of each of the Missions under specific heads so as to enable the stakeholders to track what is happening in different areas concerning climate change. Besides, the information about the adverse effects of climate change should be displayed in the portal so as to sensitize and involve the public at large on this important issue.
- The Committee would also like to recommend that six monthly report of each Ministry/Department administering the specific Mission(s) giving the status of implementation on various parameters should be laid in Parliament.
- An analysis of financial support from each of the source viz. budgetary support, private investment, viability gap funding, international aid should be undertaken by the Government and the revised mission document be brought out indicating therein clearly about the sources of financing.
- For achieving water use efficiency, free water should be provided upto a limit for all the sectors. Above all there is a need for sensitizing the people at large about the alarming situation with regard to water so as to involve them in the Mission.
- The Committee note that the National Mission on Sustainable Habitat is of critical importance to make our habitats - both urban and rural better, livable and with minimal carbon footprint. To make it possible, an integrated approach to resolving existing issues of pollution, congestion and environmental degradation is needed. This also requires people's participation. Private sector participation is also important as the need for funding may not be fulfilled by the Government alone. Adequate steps to encourage people's participation and involvement of private sector in the programme should, therefore, be taken.
- The farmers should be incentivized for use of specialized machines which cut the crop residue from the bottom or removing the stubble manually without resorting to crop residue burning.
- A Committee comprising of experts to formulate the guidelines, to be observed while preparing the roadmap for Himalayan Eco-tourism, should be constituted. The guidelines should be designed keeping in view the entire Himalayan range from West to East.

- Urgent steps are required to create a mechanism involving all the stakeholders who are directly or indirectly affected by the changes in Himalayan system so that integrated approach is adopted in the entire Himalayan area. Such a platform will need international cooperation from all the countries falling in/connected to the Himalayan range.
- As a number of agencies are expected to work together to deal with this crisis like situation, the action needs to be urgent, integrated, coordinated, collaborative, collective and effective global, national and local harnessing the energy of all citizens.

