



Research Article

EIGHT MISSION FOR CLIMATE CHANGE: INDIA

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ABSTRACT

The paper makes an assessment on eight missions under the government's major climate change initiatives to combat climate change. The pivotal approach of the study identifies eight mission measures that promote our development objectives [with] co-benefits for effectively addressing climate change. The study gives that the problem of climate change can be dealt with through measures

of eight missions like the expedient building of extensive water reserves, Joint Forest Management (JFM) and installation of biomass power plants. Therefore, there is a chance that India may remain in a perilous position as a result of the projected changes in climate impacts. The eight mission initiatives reflect sustainable development in the context of ecological-based resource capacity building. The primary goal of constructing climate resilience is to reduce communities' sensitivity to the numerous consequences of climate change. The fundamental technique of the current research is a review of government policy for a complete overview of discourses and content analysis at the national level.

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INTRODUCTION

In June 2008, the Government of India launched eight missions as part of the National Action Plan on Climate Change (NAPCC). The eight mission is a path-breaking initiative of the government as far as its climate change policy is concerned. The eight mission is partly the result of increasing pressure on India put by international political leaders as India is a significant emitter of Green House Gases (GHGs) as far as cumulative emission is concerned and, partly, India's continuous engagement in the international climate change negotiations for getting its due as a victim of climate change impact. The eight mission underlines domestic and international climate change policy to ease international pressure and convince the selected group of people (politicians, bureaucrats, military officials etc.) at the domestic level about the urgency of the problem. The issues linked to eight missions are implemented and carried out with the help of the cross-ministerial and institutional network (Ministry of Environment and Forest, 2010).

REVIEW OF LITERATURE

Eight missions have the potential to establish a low-carbon economy by leveraging cutting-edge and developing technology (Narain, Sunita, 2008). India's eight missions say that the future should be free to pursue economic expansion to reduce poverty without limiting the pollution released into the atmosphere by prioritising economic growth over emission reduction goals (Sharma, 2008). In contrast, some people are

concerned that these actions do not have a long-term plan. For instance, the eight mission has no strategy to ensure that the most disadvantaged people have access to the bare necessities of life (Kapur, Pratap, & Khosla, 2009). Poor people's needs must be factored into any policy that addresses a novel collection of conditions and elements (Rahul Goswami, 2008). Greenpeace considers solar power the policy initiative that stands out the most among the eight missions. The focus on solar energy demonstrates the country's forward-thinking approach to energy planning and its intention to use the country's potential for solar energy. However, Greenpeace criticised the plans and actions are lacks ambition and specificity about the energy efficiency goals the government aspires to reach (Dhar, 2009). However, the FICCI (Federation of Indian Chambers of Commerce and Industry) has voiced their approval of the policy, stating that the eight missions will be crucial in leveraging energy efficiency across all sectors of the economy (Sonu Jain, 2008). Others have commented that widespread public awareness is essential for eight missions (Harshal, 2008).

Further, government agencies have not been able to secure release from political and developmental barriers, so the eight missions' potential for expansion remains restricted (Prodipto Ghosh, 2009). Under the eight missions, the water mission is related to Water Ministry is just one of several crucial departments under state jurisdiction rather than federal oversight (see List II, Schedule 7 of the Constitution)(Divan & Rosencranz, 2008). Different levels of eight missions'

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dedication can be seen across India's many states due to the country's uneven economic and social development (Kapur, Pratap, & Khosla, 2009). Not all states are as far along as those who have mandated renewable energy goals and are actively working to develop their renewable resources (Times News Network, 2008). Despite the country's need for rapid economic growth and development, India has repeatedly underlined the significance of integrating climate change policy with these goals (Bhan, Sharma, Ashwin, & Mehra, 2016). Defending India's position as a developing nation and the importance of continued growth in its efforts to adapt to climate change and lessen its overall susceptibility (PMCCC, 2008). That is why the eight missions focus on diversifying India's energy mix away from its reliance on fossil fuels and toward renewable power sources. It has already been established that the motivation and drive to achieve long-term economic growth varies from state to state. For example, Gujarat has made great strides toward utilising renewable energy by constructing many power plants (Business Standard, 2009). Establishing such renewable energy plants in Gujarat would unquestionably lessen the state's potential greenhouse gas emissions. None the less, the precise amount of greenhouse gas emissions reductions these projects are achieving is unclear (Krittivas, 2008).

The eight missions have been criticised for failing to set firm goals, especially in the extremely important field of water management (Viswanathan & Sridhar, 2009). India's rapid economic development depends on its ability to manage its water supply effectively. Until now, "India has addressed climate change predominantly in the energy sector, and the water resource sector has not received the priority attention it deserves" (National Sample Survey, 2019). The Indian sub continent faces an increasing water crisis. Water scarcity is a severe problem in many Indian states (National Sample Survey, 2019), and the World Bank has issued a similar warning about India's impending water crisis (Mahanta, Chandan, 2019). For potential water shortages brought on by climate change, the National Water Mission of the eight missions suggests a new national water policy be implemented. Specifically, states that increasing water storage capacity, thinking about decreasing subsidies that encourage over consumption, and making better use of ground and surface water are all urgently needed if climate change risks are to be incorporated into water management planning (National Sample Survey, 2019).

Moreover, on the other hand, privatising water management and raising prices for drinking water are incredibly unfair and go against people's fundamental human right to life (David & Amit, 2009). It has also been argued that, despite the policy's claims to be democratic, it is too prescriptive in its use of top-down methods and too dismissive of bottom-up ones. The community involvement that could mobilise the masses into a cohesive bloc with sufficient bargaining power to compel regulatory authorities into an adequate response is given less attention (Vijay, 2011).

The paper critically examines the overall significance of the eight missions' response to climate change. Many of the literature does not provide overall eight-mission significance & assessment concerning climate change perspectives, and these studies belong to the earlier phase of eight missions. So, the present study tries to fulfil the gap. It is crucial to note that water, energy, agriculture, forests and land use pattern are all

interconnected with climate change, and eight missions deal with all these aspects.

MATERIALS AND METHODS

The study analyses the eight-mission objective and its accomplishments in climate change mitigation. The analyses include the significance of eight missions under the Nation Action & Plan for Climate change. The research analyses used national policies and plan documents and reports such as the Ministry of Environment, Forest and Climate Change; Ministry of Jal Shakti; Ministry of Science and Technology; Ministry of Agriculture and Farmers' Welfare; Ministry of Power; Bureau of Energy Efficiency; Ministry of New and Renewable Energy Resources; Ministry of Housing and Urban Affairs and Cornell University, College of Agriculture and Life Sciences, SRI International Network and Resources Center, and Niti Ayog reports etc. Discourse sources: include journals, articles and websites on issues related to Indian climate change action and plans.

RESULT AND DISCUSSION

Eight Missions

Jawaharlal Nehru National Solar Mission (JNNSM)

The JNNSM's mission is to accelerate the deployment of solar power for electricity generation with the ultimate goal of replacing fossil fuels-based electricity generation (NAPCC, 2008). India achieved the fifth rank in solar power capacity on the global stage (MoP, 2018). The government promotes the use of solar energy through different measures such as subsidies, generation-based incentives, viability gap funding, concessional excise & customs duties, financing solar rooftop systems, a preferential tariff for power generation from solar energy and foreign direct investment (Times News Network, 2008) (Business Standard, 2009). A total of 23280 MW of installed and operational capacity has been achieved till August 2018, covering both on-grid and off-grid solar power installations. Building Green Energy Corridors has a specialised transport network that is now underway (MoP, 2018). The 194700 solar pumps were installed between March 2012 to August 2018. There were 45 solar farms across 21 states with a combined capacity of 26.500 MW till 2021. (MNRE, 2015 to 2021).

National Mission for Enhanced Energy Efficiency (NMEEE)

Incorporating the Energy Conservation Act of 2001 provides mandates for implementing energy efficiency measures through the Central Government's Bureau of Energy Efficiency (BEE) (Bureau of Energy Efficiency, 2012). Several initiatives were launched to reduce electricity use by 10,000 MW by the end of 2012 under the 11th Five Year Plan. BEE designated agencies in each state, which is a significant step toward achieving this goal. New initiatives numbering four are planned to improve energy efficiency (Bureau of Energy Efficiency, 2012; BEE, 2016; BEE, 2017), in the following ways:

- a. Certification of energy savings that might be exchanged as part of a market-based system to increase the cost-effectiveness of energy efficiency upgrades in energy-intensive significant companies and institutions.

- b. Increasing the uptake of more cost-effective energy-saving appliances in specific markets by developing and implementing new strategies
- c. The development of measures to aid finance programmes across all sectors by acquiring projected energy cost savings in the future.
- d. Providing financial incentives for energy conservation
- e. The Perform Achieve and Trade (PAT) programme has been a component of the NMEEE since 2012. The first PAT cycle ran from 2012 to 2015, saving 8.67 million tons of Oil Equivalent (Mtoe) energy and reducing 31 million tons of CO₂ emissions (BEE, 2016). In the Second cycle, PAT (2016-2019) designated 621 customers from 11 different sectors were given Specific Energy Use objectives, and it is expected that these targets would result in an overall savings of 8.869 Mtoe of energy (BEE, 2017). In March 2017 third round of PAT was announced for a total decrease in energy usage of 1.06 Mtoe. The fourth cycle of the PAT has been underway since April 1, 2018, and during this time, 109 Designated Consumers have been notified from the existing PAT sectors, in addition to two new sectors added, Petrochemicals and Commercial Buildings (MoP, 2022).

Green India Mission (GIM)

The GIM's purpose is to increase India's forest cover from 23 per cent to 33 per cent of the country's total area, which involves the afforestation of 6 million hectares of degraded forestlands (Ministry of Environment and Forests, 2011). This national initiative aims to improve ecosystem services, including carbon sinks. Forests are crucial to maintaining biodiversity and keeping the environment stable. It seeks to restore degraded forestland through the direct action of local communities organised through Joint Forest Management Committees with the Department of Forest in state governments (Ministry of Environment and Forests, 2011). The 626 million rupees were distributed to 27 states and union territories over two financial years (2011–12 and 2013–14) as a fund to carry out preparatory activities during the preliminary phase of the Green India Mission (MoEFCC, 2018). These activities included institutional strengthening, training, identifying landscapes, and preparing perspective plans at the state and UTs levels. A total of 1,439.6 million was spent up to March 2018. The Nagar Vana Udyan Yojana programme was initiated to encourage urban forestry. Green India Mission, Mahatma Gandhi National Rural Employment Guarantee Act 2005, and Compensatory Afforestation Fund Management and Planning Authority convergence guidelines have been produced (MoEFCC, 2018; MoEFCC, 2015; MoEFCC, 2015).

National Mission for Sustainable Habitat (NMSH)

The NMSH intends to promote energy efficiency as a central component of urban planning as part of this National Mission. Expanding the existing energy conservation building code, increasing enforcement of automotive fuel economy standards, using pricing measures to encourage the purchase of efficient vehicles and incentives for the use of public transportation are such initiatives under this mission (Ministry of Urban Development, 2011). The NMSH emphasises Mission Plan, and National Urban Livelihoods Mission constitutes the National Mission for Sustainable (CEA, 2018). Besides these,

NMSH has supported several new initiatives since 2015, such as Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Smart City Initiative, Heritage City Development and Augmentation Yojana (HRIDAY), Swachh Bharat Mission. In addition, the New Energy Conservation Building Code 2017 has been released and applies to commercial structures with a connected load of 100 kW or more (MoH&UA, 2021; CEA, 2018b; DST, 2017; MoPNG, 2018; MoHUA, 2018; MoP, 2018; GRIHA, 2018).

National Water Mission (NWM)

The National Water Mission aims to address the water shortage problem due to climate change. According to the mission's blueprint, National Water Mission was launched to facilitate integrated water resource management that contributes to water conservation, waste reduction, and a more evenly distributed water supply among the states (MWS, 2011). It aims to ensure that new and relevant technologies, such as low-temperature desalination technologies that allow for the use of ocean water are adapted to meet the water demand of coastal towns with inadequate alternative water supplies (Ministry of Water Resources, 2015).

Improved above- and below-ground storage, rainwater harvesting, and equitable, efficient management structures would all be a part of the National Water Policy. The mission seeks to establish innovative regulatory frameworks with relevant entitlements and pricing. This would also aid in expanding irrigation where possible and enhancing the efficiency of current systems by rehabilitating worn-out infrastructure and making an extra effort to boost storage capacity. Large-scale irrigation programmes that use sprinklers, drip irrigation, and ridge and furrow irrigation would also be encouraged through incentive structures to encourage water-neutral or water-positive technologies and recharge subterranean water sources (MWS, 2011). Six states—Maharashtra, Assam, Telangana, Manipur, Andhra Pradesh and Kerala have begun implementing water management and increased water efficiency in the irrigation area. The design of a state-specific action plan for the water sector is based on a scientific assessment of the availability and demand for water and its sensitivity to the effects of climate change. In addition, the mission fills critical governance gaps through an institutional mechanism and state water budgeting. The development of 1082 new groundwater monitoring wells is the result of this mission. Revised Domestic Water Policy (2012) and adopted. Developed of WRIS (Water Resource Information System) is another achievement in providing all information regarding surface and groundwater (Ministry of Water Resources, 2011).

National Mission on Sustainable Agriculture (NMSA)

The NMSA is committed to assisting the agricultural sector in adapting to climate change by funding research into and implementing climate-resilient crop varieties, weather insurance mechanisms, and farming techniques. The goal of this mission is to help farmers in India adapt to the effects of climate change by finding ways to manage the effects of drought, heat stroke, and other weather extremes, as well as by creating new crop types and alternative cropping patterns (Department of Agriculture and Cooperation, 2010). Convergence and integration of information technology, geospatial technologies, biotechnology, and traditional

knowledge and practice systems help to facilitate this. A new system of financing and insurance would be developed as part of this objective to speed up the implementation. The emphasis can be placed on boosting the efficiency of rain-dependent farms. India would undoubtedly participate in global initiatives such as the environmentally sustainable green revolution (Department of Agriculture and Cooperation, 2010). Few reports on sustainable agriculture policy and plan are available on the national mission due to less implementation and acceptance of action. However, by the end of the 2016–2017 growing season, 1.59.813 hectares of land under the Rice Intensification System and 1.62.274 hectares had been farmed using the Rice Direct Seeding System. In addition, during the 2016–17-year production of neem-coated urea (as a fertiliser) reached 24.2 million tonnes, which reduced N₂O emissions (Cornell University, 2022).

National Mission on Sustaining Himalayan Ecosystem (NMSHE)

The NMSHE's objective is to prevent the Himalayan glaciers from melting and safeguard the region's exclusive biodiversity. A big part of India's water supply comes from melting glaciers in the Himalayas; therefore, it is essential to protect the region's biodiversity, forest cover, and other ecological benefits from the effects of climate change. Receding glaciers in the Himalayas taken seriously, it also involves a concerted effort from climatologists, glaciologists, and other professionals, as well as the sharing of data among South Asia and other countries that share the same ecological region (Department of Science and Technology, 2010a).

The state-level climate action cells have been set up in the Himalayan area to conduct assessments of vulnerability & risk, design & execute educational initiatives and raise public awareness. NMSHE has established six "Task Forces" for coordinating institutions to address ecological & environmental change concerns in Himalayas Region. The proposed mission completed training one hundred people in fields related to the Himalayan ecosystem and its environmental impact assessment. The implementation of six theme-based training systems for community-based organisations and the creation of twenty-five capacity-building programmes. In order to track how the Himalayan system is changing due to climate change (MoEF&CC, 2015 to 2022; DST & MoST, 2015 to 2022).

National Mission on Strategic Knowledge for Climate Change (NMSKCC)

The mission's research agenda can include studying how climate change has affected coastal communities' health, population, migration patterns, and livelihoods. It also supports the connectivity of academic and scientific research institutions across the country to create specialised climate change-related academic units. Additionally, it has been proposed that the mission establish a Climate Science Research Fund to finance studies in this area. Venture capital investments would support the private sector's adaptation and mitigation technology development efforts. It was decided that some research hubs would conduct studies to back up policy and implementation. Knowledge sharing based on research findings is another priority for the Mission (Department of Science and Technology, 2010).

Till now, Madhya Pradesh and Punjab have established state institutes for research and education on climate change (MoEFCC, 2018). In order to shed light on the selection of technologies and the prioritising of those technologies concerning climate change adaptation and mitigation, called "Global Technology Watch Group" has been established. In collaboration with the National Institute of Advanced Studies in Bengaluru and the Indian Institute of Technology in Chennai, NMSKCC will establish "Technology Watch Groups on Advanced Coal Technology and Renewable Energy" These two groups will go to monitor developments in their respective fields. (DST & MoST, 2015 to 2022; MoEF&CC, 2015 to 2022)

Evaluation of Eight Mission

According to various government reports and documents, eight missions demand rapid action for the sake of adaptation and prevention. Action taken by the eight missions to combat climate change would have to be a national-level effort. Among the many positive outcomes of the eight mission program's development of the sector is the restructuring of many agencies' participation in climate change technology research and development, promotion, manufacturing, and installation (DST & MoST, 2015 to 2022; BEE, 2016; National Sample Survey, 2019; MoPNG, 2018; MoP, 2018; MoHUA, 2018; MoEFCC, 2018). There is a clear chain of command among the several Indian institutions working on the country's eight missions related to the national action plan to combat climate change. Effective coordination across institutions has resulted from this hierarchical setup (PMCCC, 2008). Eight missions' linkage entails five-year plans such as energy policy, water policy, land use policy, agricultural policy, transport policy, industrial policy, urban development policy and health policy etc. (PMCCC, 2008). Prospective areas for the eight missions' adaptation include agricultural improvement, protection from drought, expansion of forest areas, water, coastal regions, health, risk financing, and disaster management (Department of Agriculture and Cooperation, 2010). Power from renewable sources such as biomass, solar, and hydroelectricity is crucial for accomplishing several key goals, including minimising the effects of climate change and providing reliable access to energy supplies (BEE, 2016).

Fundamental to the eight mission's approach is identifying initiatives that further our development goals and provide co-benefits for efficiently tackling climate change. Eight mission is predicated on safeguarding low-income and vulnerable portions of the population, achieving national growth, employing appropriate technology, generating new and imaginative forms of market, and other such considerations (DST & MoST, 2015 to 2022; BEE, 2016; National Sample Survey, 2019; MoPNG, 2018; MoP, 2018; MoHUA, 2018; MoEFCC, 2018). Eight missions minimising the problem of climate change by putting into action a variety of different solutions, such as the expeditious construction of large water reserves, joint forest management (JFM), the installation of biomass power plants, and other similar solutions (MoEFCC, 2015; MoPNG, 2018; MoEF&CC, 2015 to 2022; Ministry of Water Resources, 2015). There are eight unique mission techniques, both of which are valid solutions for addressing the threat posed by climate change. First, to mitigate the effects of climate change, and second, to pave the way for

India's sustainable development to be more environmentally responsible.

India's eight mission steps to combat climate change are not wholly novel because they build on the foundation of existing environmental legislation and policies & plans, but the eight-mission approach to the problem is founded on the idea of a centralised. Eight missions have sprung up throughout India in response to climate change.

CONCLUSION

Eight mission's actions and policies saw a shift towards resource management with environmental protection through a sustainable development approach. The eight mission objectives have targeted different sectors affecting climate change processes and balanced development needs with environmental concerns. Eight missions have adopted proactive in climate protection, such as shifting to cleaner technologies, investing in R&D, lowering CO₂ emissions, energy efficiency, enhancing water management, sustainable habitat, protecting Himalayan ecology, agriculture management, increasing forest cover and climate change mitigation appliances. The mission's overarching goal is to implement multiple policies for reducing the effects of climate change across all affected strategic domains.

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