

SUSTAINABLE DEVELOPMENT AND DISASTER RISK REDUCTION MAINSTREAMING: NEXUS BETWEEN POLICY PROCLAMATION AND IMPLEMENTATION

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How to cite this paper:

Pandey, Akanksha (2022)
Sustainable development and
disaster risk reduction
mainstreaming: Nexus
between policy proclamation
and Implementation, Journal of
Global Resources, Vol. 08 (01)

DOI:

10.46587/JGR.2022.v08i01.016

Received: 28 Sep. 2021

Reviewed: 01 Nov. 2021

Revised: 16 Nov. 2021

Final Accepted: 01 Dec. 2021

OPEN ACCESS
Freely available Online
www.isdesr.org

Abstract: *Land-use planning, disasters and development are clearly related. Risk-sensitive development practices and responsible land use planning can contribute to resilience building. At the same time, poorly planned development can intensify social, economic, physical and environmental vulnerabilities of the population and can trigger devastating extreme events. Therefore, the process of disaster risk reduction has to be weaved into the developmental framework and India has given its commitment at national and international forums to ensure the same. However, since there is no specific policy on integrating DRR into development planning in India, this paper discusses the extent to which such integration is seen through one of the major projects- the Navi Mumbai International Airport (NMIA) in the planning and approval process, especially in the contexts of environmental vulnerabilities. The study suggests that there are serious gaps between the policy proclamations that seek to ensure sustainable development through DRR integration into development projects and its implementation. Thus, much more work is needed to enforce the idea of mainstreaming DRR in to foster risk aware or risk sensitive development. Data for this qualitative study was obtained from both primary as well as secondary sources.*

Key word: Disaster, Development, DRR, NMIA, Vulnerability, Environment.

Introduction

Disaster and development are clearly related (Pelling, 2003). Protecting life and livelihood is fundamental to any development goal. Poor development can intensify vulnerability and cause devastating impact, whereas wise development practices may reduce vulnerability. Similarly, infrastructural development can potentially play a very important role in reducing the vulnerability of the people (Ming et al, 2014). At the same time a construction project which is not cognizant of disaster risk can adversely affect the social, economic, physical and environmental vulnerabilities of the population (IPCC, 2012; Wolf, 2013). Therefore, it is essential that development plans and projects consider risk reduction (Andharia, 2018). This also means that disaster risk reduction is a development issue and must be integrated in to development processes to achieve sustainable development (UNDP, 2015). In the growing economy of India infrastructure sector plays key role. India's overall development is propelled by the infrastructure sector which includes power, bridges, dams, roads and other urban infrastructure development. Between April 2000 and March 2021 construction development sector and infrastructure activities sector received FDI inflows amounting to US\$ 26.08 billion and US\$ 24.72 billion, respectively. This sector is growing at such a speed that in 2016 India jumped 19 places in the index of World Bank's Logistics Performance (LPI) 2016, and ranked 35th amongst 160 countries (IBEF, 2021). Despite the economic growth with a GDP exceedingly over US\$ 2 trillion India has not been able to manage with the challenge of developing safe infrastructure in the era of rapid urbanization. Lack of proper infrastructure planning and implementation caused by migration of large population, unplanned construction and encroachment into environmentally fragile areas and the government's lack of adherence to mitigation standards has increased the vulnerability and risk to hazards both natural and manmade (GOI, 2015). Environmental degradation caused by such unplanned development activities has been linked with the increasing climatological and hydrological or meteorological disasters. Further, post disaster contexts also attract a huge amount of resources to rebuild the infrastructures. This diverts the resources meant for the development to recovery processes which includes rebuilding and rehabilitation (Palliyagurua et.al., 2012, World Bank Group, 2015). However, a report of United Nations prepared for the third world conference on DRR argues that the planning and development of infrastructures is still not viewed in the larger perspective of its implication on the whole system. Rather, the approach toward infrastructures is still 'asset based' which affects the visualization of systematic DRR integration in to its planning. Also because of the asset based approach towards infrastructures the risk assessments are not done considering the larger system in which the infrastructure lies¹.

India has endorsed various international DRR frameworks and has shown its commitment towards reducing people's vulnerability by increasing resilience and safeguarding the environment. Such treaties and frameworks include HFA, Sendai Frameworks for DRR, Paris Climate Agreement etc. India has also implemented laws and policies that are aligned with the commitments it has made at different forum to reduce disaster risk. Though there is no specific policy on integrating DRR in to infrastructure planning in the country, but there are a range of laws and legislations which address the issue of safer constructions project planning which do not harm people and environment or add to their disaster vulnerability. Such laws and policies are: Disaster Management Act, 2005, National Disaster Management Policy, 2009, National Disaster Management Plan 2016, Environment (Protection) Act, 1986 and Model Town and Country Planning Legislation, Development Control, Building Regulations/Byelaws and Zoning Regulation etc. These policy documents intend to integrate DRR in to development plans and projects including infrastructure projects. Ironically, despite having ratified international frameworks for

¹ See, Infrastructure and Disaster: A contribution by the United Nations to the consultation leading to the Third UN World Conference on Disaster Risk Reduction. Available at https://www.preventionweb.net/files/40429_infrastructure.pdf (Accessed on March 2018).

DRR and enacting various legislations and rule for hazard mitigations, frequency of disasters has been increasing at an unprecedented scale as in case of India during the thirty year's time span between the years 1980 to 2010, disasters have destroyed properties and infrastructures costing more than US \$ 4800 million (CRED, 2021). However, since there is no specific policy on integrating DRR into development planning in India, this paper discusses the extent to which such integration is seen through one of the major projects- the Navi Mumbai International Airport (NMIA) in the planning and approval process, especially in the contexts of environmental vulnerabilities.

The Case of Navi Mumbai International Airport (NMIA) Project

Navi Mumbai is a part of Mumbai where the universe of this study 'NMIA' is located at. Navi Mumbai spreads over parts of two districts of Maharashtra; Thane, and Raigad. The region is hilly in some parts, and certain areas of the region are protected wetlands. After the enactment of Maharashtra Regional and Town planning Act in 1967 CIDCO was formed in March 1970 under Indian Company Act 1956. CIDCO was given the authority for planning the Navi Mumbai in 1971. During rainy season, issue of storm water is a critical issue in Navi Mumbai. This is because of 20 percent area of the Navi Mumbai is low lying and prone to tidal submergence. Environmental degradation, reclamation, slum, cutting of mangroves, parking, pollution, removal of hills, etc. are the other critical issues in the city (NMMC, 2018). NMIA Project which has been studied here is a large development project which has been recently sanctioned by government to start the construction process. This project has been planned on an environmentally very sensitive land and in a low lying area. The project involves huge impacts on environment and population. Some of the major issues involved with this project are displacement, diversion and trimming of rivers, hill cutting, levelling and filling of marshy land in the coastal areas, cutting and damaging mangroves, and commercial construction in CRZ areas (CIDCO 2010, Jamwal 2010, Goenka and Patel 2010). The project has received the sanction from government to start the construction.

Figure 01: Location of the Project on the Map of Mumbai (CESE 2009)



Rationale

There are several studies on DRR which have focused on how infrastructure project contributes to increasing the vulnerability of the people. However, there is a big void in the academic study of Indian practices on the matter of implementation of mainstreaming of DRR through infrastructure planning and construction. There is also a void in the academic literature on how

important stakeholders (applicant authority, government departments) while sanctioning a large development project address the issue.

Objectives

The study with its limitations has intended to understand how the issue of reducing people's vulnerability and safeguarding environment is addressed while planning and approving an infrastructure project. It also aimed at understanding how the policy level commitment of sustainable development through DRR integration into development projects translates at the implementation level. This helps in understanding the convergence or gaps between the policy level commitment on DRR integration and actual practice in infrastructure planning and construction. This study has looked at the impact of NMIA project on people and environment and how efficiently the aspect of vulnerability reduction was conceptualized in NMIA project. The study has also explored how cognizant the different major stakeholders involved in the project planning and implementation were of reducing disaster risk. This has helped in understanding the relationship between policy level commitment of integrating DRR into infrastructure projects for achieving sustainable development and infrastructure planning and implantation in India.

Methodology

To fulfill the research objectives a qualitative research strategy and case study design has been adopted. The case of NMIA project which is also a representative case of infrastructure projects in India has been chosen to address the research questions. Data was obtained from primary as well as secondary sources. Primary data were obtained through semi structured open ended interviews with the stakeholders. These stakeholders involved in the study were civil society representatives who have been working with the NMIA project affected people. The other stakeholders were disasters management policy makers at national and state level, applicant authority CIDCO, and various institutions such as ministries, department and courts involved in process of NMIA planning. The secondary data were obtained from the EIA study report of the project and various documents related to the sanctioning of the NMIA project. The data obtained from these various sources was thematically analyzed to reach to the conclusion. DRR framework in the context of sustainable development from ISDR (2004) helped in understanding the integration of DRR into the NMIA project from different aspects of sustainable development.

Research Findings and Discussions

Selection of an Environmentally Very Sensitive Land for Constructing a Development Project NMIA:

The land use pattern in case of selecting site for the NMIA did not cater to the DRR in a way that it has adversely affected environmental sphere of human life along with the vulnerability of the society and the economy as the core areas. The selected site for the NMIA requires significant destruction to the local environment which has implication on increasing the risk of flood in Navi Mumbai. The construction of NMIA project requires cutting a hill, destruction of huge mangrove area, diverting and channelization of two rivers and filling up a huge mudflat area to level it to prepare the ground for the project. Further, the airport site comes under Coastal Regulation Zone CRZ (I, II, III) area. According to the EIA report of the project's entire airport zone of 1615 hectares consists of mudflat, farmland and hills. The selected site for the project is environmentally very sensitive zone as the land cover analysis in Environmental Impact assessment (EIA) report reveals that total land in project site consists of Mud flats (26.77%), mangrove area (9.29%), and area under creek (8.83%), area which is yet to be urbanized (open) (38.47%) (CIDCO 2010).

Table 01: Land Covers Analysis of NMIA Project Area (CESE 2009)

Type of Land	Total Area (Hectare)	Percent
Agriculture	104.92	6.50
Mangrove	150	9.29
Open (urbanizable) area	621.21	38.47
Built up	51.506	3.19
Quarry	66.37	4.11
Creek/ River	142.61	8.83
Hill	46	2.85
Mud Flats	432.38	27.77
Total	1615	100

The CRZ Notification, 1991 is one of the most crucial legal policies to safeguard coastal environment in India. For regulating any development activities, the coastal stretches of high tide line of the landward side are classified under the four coastal zone regulations. These zones are CRZ-1, CRZ-2, CRZ3 and CRZ 4. Any infrastructure development work is controlled in CRZ areas not only to save any damages to the coastal areas but to also reduce vulnerability of the coastal population and mitigate disaster risks to the population and property (MoE&A, 1991).

The coastal areas are generally prone to the natural hazards such as storms, cyclones, Tsunami etc². It's important to maintain coastal ecosystem as they can prevent natural hazards in turning in to disasters (MoEF 2005). CRZ categories play very crucial role in integrating DRR in to infrastructure project by regulating construction activities in to the coastal areas which play significant role in mitigating the impact of disasters such as flood, Tsunami and storm. But the areas selected for the NMIA project were declared under CRZ categories many years before the formulation of NMIA project which happened in 2007. In that case the question arises that why the applicant authority did propose a huge construction activity in to a very sensitive coastal area which would cause immense damage to the local environment. CIDCO and GoM applied to MoCA for approving NMIA project knowing very well that the site falls under the approved CRZ (I, II, III). This explains that CIDCO and GoM were not sensitive enough towards the vulnerability of coastal environment. This also indicates a huge flaw in government's strategy to safeguard coastal environment as despite the provisions of CRZ Notification, 1991, application for construction activities were entertained by ministries such as MoEF and MoCA. The NMIA project was not a life saving project which would have required amendment in a legal notification which is very crucial to saving lives by decreasing the disaster risk.

Risk of Flood

People in the project affected area have been skeptical about the increased risk of flood in the area due to the NMIA construction. Panvel is a low-lying area. This makes it already vulnerable to floods. Coastal ecosystem such as mudflats and mangroves are crucial to reducing the impact of flood. Diversion and channelization of rivers may intensify the risk of flooding in the area.

Impact of Mudflat Filling

Mudflats help in reducing the intensity of flood in the coastal areas. Mudflats dissipate wave energy, thus reducing the risk of flooding low-lying land (JNCC 2008). NMIA project site consists of Mud flats which would be filled with concrete and levelled to prepare land for constructing airport. Hence project would completely damage the mud flats in the project site. The study of water level rise pattern conducted by CWPRS in 2009 indicated that the filling of mudflats in the project site would be marginal rise in the water levels in the Panvel creek reach along the

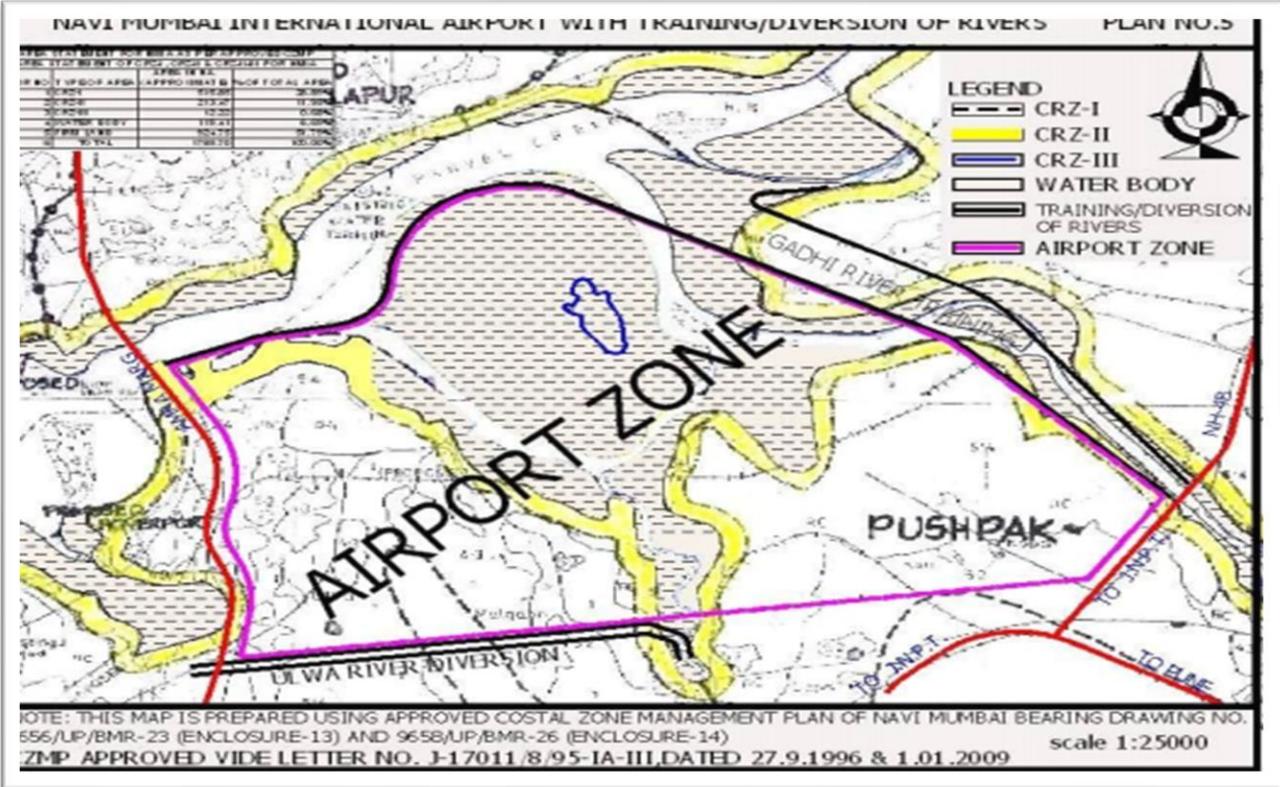
²See MoEF (2005): Report of the committee Chaired by M.S Swaminathan to Review the Coastal Regulation Zone 1991.

proposed airport boundary. But the impact of the water level rise can be mitigated by elevating the project by 7.0 to 8.5 meters. This explains that despite knowing the fact that project construction will increase the water level in Panvel creek NMIA is hugely dependent on technocratic solutions to avoid the impact of water level rise and hence avoid the risk of flooding.

Impact of Diversion and Channelization of Gadhi and Ulwe Rivers

The project’s location and activities will require diversion of the Ulwe River to the west in to the Thane Creek from the Panvel creek. River has a catchment area of approximately 35 square kilometres. Project also requires training of the Gadhi River as it flows through the site where airport construction is planned. Gadhi River falling in the airport area will be trained to meet Panvel creek directly. IA study agrees that this change in the natural flow of the rivers would adversely affect the aquatic ecosystem. It mentions that “Channelization leads to altering of original dimensions of the rivers along with extreme physical disturbances, alterations in river bed morphology, change in flow characteristics and elimination of bank cover. On the recommendation of MoEF CIDCO appointed CWPRS, Pune for mathematical modelling on the hydrology of the NMIA project area. The idea behind this study was to reduce and mitigate any risk of flood or any adverse impact of channelizing these rivers in and around the airport site and to see the impact of NMIA on the water level rise in the region. CWPRS, Pune studied 100 years rainfall pattern. The study indicates that the channelization of rivers would cause rise in the Panvel creek’s water level, and also along the airport site. Due to diversion of Ulwe river there will be rise in the Ulwe’s water level too. This rise in the water level will be more near the point of diversion of Ulwe River (CWPRS, 2009).

Figure 2: Core Airport Zone with the Training and Diversion Routs of Gadhi and Ulwe Rivers (CESE 2009)



But CWPRS rejects any possibility of additional flood due to the airport project in the area. Though it suggested that to mitigate and prevent flood risk airport complex should be built at an elevated height of 8.5 meter from the earlier planned 7.0 meters. The other stakeholder and the project implementing authority CIDCO said that the mitigation measures suggested by the CWPRS have

been incorporated in to the NMIA project. EIA study of the project is also easily convinced with any finding that goes in the favour of the NMIA. However, people in the project affected area are concerned over the issue of flooding in the project site due to those drastic changes in the local environment and alteration of natural flow of two rivers. The natural flow pattern of Mithi River was changed to build the runway of CSIA. But during the floods of 2005 the river breached the airport wall and started flowing through the airport (Goenka and Patel 2010). Also, the Chennai International Airport has built its second runway runs over the river Adyar itself, with a bridge constructed across Adyar extending the runway's length by 1,400 metres to a total of 3,445 metres. But it couldn't survive the floods of 2015 in Chennai and the whole airport along with the city got seriously flooded (Jamwal 2015). It could be that reducing the size of the NMIA project or finding another site for constructing the airport was a better idea than having an airport with two parallel runways at the cost of the natural flow of two rivers and have the risk of flooding.

Impact of Mangroves Destructions

Mangroves play a very important role in maintaining eco system. Experiences across the globe suggest that mangroves act as natural barrier against the impact of storm and Tsunami in the coastal areas. Government in India also realizes crucial importance of Mangroves in safeguarding coastal eco system and hence mangrove protection has been specifically mentioned in the Forest conservation act 1980. After Tsunami, in the year 2006 Bombay High Court passed an order to stop the destruction of mangrove forest. This order to conserve mangroves has helped Mumbai region including Navi Mumbai region maintain its Mangroves. The Coastal Regulation Zone Notification (1991) under the Environmental Protection Act (1986) recognizes mangrove as ecologically sensitive and categorizes them as CRZ-I which means that this is vegetation spread over an area of protection of the highest order and any construction on that should be a prohibitive action.

The NMIA project site has total 161.50 hectares of mangroves. But due to the project coming in to that site all of these 161.50 hectares of mangroves will be damaged and lost. Project site doesn't have any forest area but it has naturally growing trees and vegetation. But due to the location of the project in an environmentally sensitive zone all of these vegetations in the project area will also be lost. This would increase the vulnerability of the project area to the storm and Tsunami. Despite the fact that destroying the mangroves in the project area would increase the vulnerability of the project area to the storm and Tsunami Bombay High Court permitted it with conditions of compensating the losses through artificially grown mangroves. Though CIDCO has agreed to the conditions of Bombay High Court but success rate of growing artificial mangroves is very poor. The Bombay High Court and CIDCO have not looked at this angle (Goenka and Patel 2010). However, NMIA has plans to artificially maintain and enhance the natural environment in the airport vicinity which involves development of 245 Ha Mangrove park/biodiversity zone on Waghivali island along with the regeneration of lush green mangroves in an area of 310 ha at Kamothe and 60 ha at Moha Creek which is being proposed for preserving the ecological balance of the project area. In addition, a large water body to the north of the site has been retained' (Construction Opportunities, 2016). This explains the NMIA project is heavily dependent on adopting technocratic solutions to compensate the losses it would make to the environment and coastal ecosystem. But past experiences of building infrastructures in the flood plains or in the natural course of rivers in Mumbai and Chennai adopting technocratic solutions have failed. Hence, there is always a risk of flood in the project area. However, as per the national disaster management policies a development project should adopt Do No Harm Approach to People and Environment in its construction and planning. But in the case of NMIA, project has severely damaged the coastal environment and has increased the risk of flooding in the area rather than decreasing.

Impact on the Vulnerability of the Project Affected Population

Study found that people whose livelihood concerns are involved in the NMIA project were not involved properly in the process of planning the NMIA. People were not taken in confidence before planning the NMIA project. Site for the project was finalized before consulting the population of that area. Hence, Gol and applicant authority CIDCO planned the project in Navi Mumbai without consulting local people. Hence, the applicant authority for implementing NMIA project sees PAPs outside of the project planning. There is a legal provision of public hearing to involve people in the process of project planning so that their concerns could be addressed in the most efficient manner for resilience building. But in case of NMIA public hearing organised by State Pollution Control Board (SPCB) of Maharashtra did not address people's concerns over the issue of livelihood, displacement and damages caused to the local coastal environment. CIDCO went to consult people only during the mandatory Public Hearing conducted by the State Pollution Control Board of Mumbai. Organizing public hearing was mandatory to get clearance from MoEF. CIDCO has limited its responsibility towards the PAPs only till the distribution of compensation and providing them a house in exchange of the house destroyed for project. One of the biggest drawbacks of NMIA project is its inability to consider a long-term livelihood sustainability of the displaced individuals, and therefore the DRR lens has been completely ignored here. This has not only weakened the policy level commitment and institutional arrangements for disaster management but has also negatively influenced people's participation, hence, increases people's vulnerability.

NMIA project is adversely affecting local people's livelihood security which could have serious implications on their vulnerability. Increased vulnerability of population will further complicate their risk to disasters. In that case it would undermine the policy level efforts of integrating DRR in to the development projects. The National Disaster Management plan (2016) and National Disaster Management Policy (2009) intended that every development project should plan in a way that it doesn't increase people's vulnerability. But in the case of NMIA plan it is evident that the project is weakening peoples coping capacity. This indicates a gap in the intension of disaster management policy on integrating DRR in to infrastructure projects and its implementation.

Ignoring the Implication on the Whole System

The idea of DRR integration as understood by the NMIA project appeared more like asset-based approach to DRR. The stakeholders involved in the NMIA project have focused more on the safety of airport project area and its safe operation. The project has ignored the overall larger perspective of its implication on the whole system. This is not in line with the policy level visualization of systematic DRR integration into infrastructure planning.

Cognizance of DRR and the Role of Different Stakeholders Involved in the Process of Project Sanctioning

The case study of NMIA revealed that the institutional mechanism existing in the country to ensure DRR integration into the infrastructure projects still has a long way to go. The case revealed that the project proposal of NMIA has passed through many ministries and different government department seeking the legal approval to start the construction. The project proposal also passed through the Bombay High Court, NCZMA, and MCZMA before the final approval. In this entire movement of the NMIA's project proposal through India's very powerful institutions, it was always known that project would be implemented in an environmentally very sensitive area which also includes CRZ areas. But this is ironic that none of these institutions rejected the idea of a second airport project citing the inappropriateness of the selected site. Other options should have been

explored. Rather, they kept on allowing the application of project sanction process to move from one department to another until all the formalities were completed to manipulate facts in favour of the project. Also, the selected site remained the same. And the damages to the coastal environment, its impact on people's vulnerability remain the same even today. The role of applicant authority CIDCO and Government of Maharashtra needs critical questioning. These government agencies proposed the NMIA project at a site despite the fact that the land was environmentally very sensitive and played a crucial role in the safety of the coastal areas of Navi Mumbai. CIDCO was absolutely aware from the beginning that a significant part of the land used for the construction of NMIA project falls under CRZ-1, CRZ-2, CRZ3 and CRZ. As per Indian policies the infrastructure development work is controlled in CRZ areas not only to save any damages to the coastal areas but to also reduce the vulnerability of the coastal population and mitigate disaster risks to the people and property (MoE&A, 1991). But the applicant authority continued to peruse the project till it got final approval and land development work started.

In 2007 starting the process of obtaining environmental clearance GoM applied to MoEF. It was only then that for the first time the issue of the impact of project site on the vulnerability of people and environment was considered. Only at this stage the issue of project area falling in to CRZ areas was discussed. In the year 2006 Ministry of Environment and Forest issued EIA notification to make environmental clearance mandatory for the Greenfield Airport project. This notification is under the Environment (Protection) Act, (1986) which is a very important Act for safeguarding the environment from any adverse impact of the development projects, and ensuring sustainable development and this is important to reducing the possibility of any disaster risk induced by the projects. The notification makes provisions for ensuring that natural resources are used wisely without harming the environment and the society. In today's world of industrialization and rapid urbanization this act plays a major role in dealing with the challenges posed by the rapidly growing needs of the multiplying population. As mentioned in the Literature Review chapter, construction of a Greenfield airport comes under category A which requires a mandatory EIA study of the project before granting it permission to start the construction to ensure that the projects do not increase any kind of environmental risk.

Hence, following the norms and suggestions of MoEF CIDCO hired IIT Bombay for Environment Impact Assessment (EIA) study and CWPRS, Pune for conducting the required hydraulic model studies. In this case of NMIA project EIA study conducted by the CESE, IIT Bombay was actually sponsored by applicant authority i.e., CIDCO. Many projects affected people shared their concern over this issue. In such a loose institutional arrangement it becomes difficult to rule out the possibility of bias of the EIA study. This can have serious implications on the government's policy level intension and need of the integration of disaster risk reduction in to infrastructure projects. EIA study has tried to justify the destruction of the local coastal environment citing that the vegetation in the project site was already decaying and hence its destruction for building the project doesn't make any serious environmental consequences. The point arises that if there is degradation of the coastal environment efforts should be made to restore it rather than using it as an excuse to destroy the environment for building constructing infrastructures. Ironically, despite there being exhaustive list of laws and legislations, powerful government institutions, and tools for protecting environment and reducing disaster risk the environment was legally allowed to be altered to suit to the needs of the NMIA. Though the ideal case for sustainable development could have been where the project planning was altered to suit the environment.

Conclusion

Despite being the need of the hour for the sustainable development there is no clear-cut policy for the DRR integration in to the development projects. Unfortunately, DRR is still an abstract

concept and is open for interpretation. This has led to the manipulation of the idea of DRR integration to favor and suit to the construction projects which can further increase the risk of disasters. The NMIA project which is a large construction project has not contextualized DRR in the contexts of socio-economic and environmental spheres of sustainable development. The stakeholders involved in the NMIA project have focused more on the safety of airport project area and its safe operation. The project has ignored the overall larger perspective of its implication on the whole system of which it is a part. It has also ignored the long-term livelihood sustainability of the displaced population. This is not in line with the policy level visualization of systematic DRR integration into infrastructure planning.

Hence, infrastructure projects in India as seen through the case of NMIA project are not cognizant of disaster risk reduction. Different government ministries and departments involved in ensuring the integration of DRR before approving the infrastructure project also did not address the issue of risk reduction in the larger perspective of sustainable development. Rather they were only concerned about the sector-specific risk reduction and mitigation in which their department specializes. This lack of coordination among different stakeholders involved in the process of integrating DRR into infrastructure projects creates the loophole through which a risky project can pass to obtain approval for the implementation as has happened in the case of NMIA project.

Hence, the study finds that there is a gap between the policy level commitment to ensuring sustainable development through DRR integration into development projects and its implementation. Given the importance of DRR integration into development projects to work towards sustainable development there should be a specific policy dedicated to DRR. This DRR policy could have stricter provisions to adapt to risk reduction approach through every development project planning and implementation. Too much dependence on technocratic solutions which may involve serious alteration to the ecology must be avoided. EIA study being an important tool for DRR integration should be an independent inquiry. This means that there has to be a mechanism through which applicant authority neither should have the power of selecting the agency for conducting the EIA nor should be allowed to pay the financial cost of EIA study directly to the agency which conducts the EIA study. This could be a way of ensuring transparency and truthfulness of such a crucial study to DRR. There is a need to strengthen Disaster risk governance system in India. This aspect should be addressed effectively.

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