पत्र संख्या-स्था-6-सामान्य-शासन पत्राचार पत्रावली/2024-25/ 4084 / राज्य कर

कार्यालय आयुक्त, राज्य कर उत्तर प्रदेश
(स्थापना अराजपत्रित अनुभाग)
लखनऊ:: दिनांक:: 28 नवम्बर, 2024

समस्त जोनल अपर आयुक्त, राज्य कर,
उत्तर प्रदेश (गौतमबुद्ध नगर जोन, नोएडा को छोड़कर)।

विषयः- राज्य आपदा न्यूनीकरण निधि के अन्तर्गत आपदाओं के प्रभाव को न्यूनीकृत किये जाने हेतु अनुमन्य कार्यों का विवरण प्रेषित करने के संबंध में।

कृपया उपर्युक्त विषयक राजस्व अनुभाग-10, उत्तर प्रदेश शासन ने पत्र संख्या-1228/एक-10-2024 दिनांक-18.07.2024 का संदर्भ ग्रहण करें, जिसके द्वारा अवगत कराया गया है कि राज्य आपदा न्यूनीकरण निधि में पर्याप्त धनराशि उपलब्ध है और विभागों से भारत सरकार की गाइडलाइन के अनुसार राज्य आपदा न्यूनीकरण निधि से वित्त पोषण हेतु प्रस्ताव प्राप्त नहीं हो रहे हैं। मुख्य सचिव, उ0प्र0 शासन की अध्यक्षता में दिनांक 05.07.2024 को सम्पन्न राज्य आपदा प्रबन्धन की राज्य कार्यकारिणी समिति की बैठक में राज्य आपदा न्यूनीकरण निधि में अधिक धनराशि उपलब्ध होने के दृष्टिगत सभी विभागों को भारत सरकार की एस0डी0एम0एफ0 की गाइडलाइन के अनुसार प्रस्ताव बनाकर उपलब्ध कराने के निर्देश दिये गये हैं।

अतः राजस्व विभाग, उत्तर प्रदेश शासन के उक्त पत्र दिनांक 18.07.2024 की प्रति संलग्न कर इस निर्देश के साथ प्रेषित की जा रही है कि पत्र में दिये गये निर्देशानुसार वांछित प्रस्ताव/विवरण उपलब्ध कराना सुनिश्चित करें।

संलग्नकः-विभागीय वेबसाइड पर अपलोड।

(सुनील कुमार वर्मा)
अपर आयुक्त(प्रशासन) राज्य कर,
उत्तर प्रदेश, लखनऊ।

पृष्ठांकन पत्रसंख्या व दिनांक उक्त।

प्रतिलिपिः- निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

1- अपर आयुक्त, राज्य कर, गौतमबुद्ध नगर जोन, नोएडा को इस अनुरोध के साथ प्रेषित कि राजस्व विभाग, उत्तर प्रदेश शासन के उक्त पत्र दिनांक-18.07.2024 द्वारा वांछित प्रस्ताव/विवरण उपलब्ध कराने का कष्ट करें।
2- अपर निदेशक, राज्य कर अधिकारी प्रशिक्षण संस्थान, गोमती नगर, लखनऊ।
3- संयुक्त आयुक्त (आई0टी0) राज्य कर, मुख्यालय को एक प्रति विभागीय वेबसाइट पर अपलोड हेतु।
4- नाजिर, राज्य कर, मुख्यालय, लखनऊ।

संलग्नकः-विभागीय वेबसाइड पर अपलोड।

अपर आयुक्त(प्रशासन) राज्य कर,
उत्तर प्रदेश, लखनऊ।

7361/ACSRT/24 वि.स. (HN)

संख्याः-1229/एक-10-2024

प्रेषक,

प्रमुख सचिव,
राजस्व विभाग,
उ.प्र. शासन।

(डॉ० नितिन रमेश गोकर्ण)
अपर मुख्य सचिव
राज्य कर विभाग
उत्तर प्रदेश शासन।

(हरी राम)
विशेष सचिव,
राज्य कर विभाग,
उत्तर प्रदेश शासन।

सेवा में,

1. समस्त अपर मुख्य सचिव/प्रमुख सचिव/सचिव, उ.प्र. शासन।
2. समस्त विभागाध्यक्ष, उत्तर प्रदेश। द्वारा अपर मुख्य सचिव/प्रमुख सचिव/सचिव

लखनऊः दिनाँकः-18 जुलाई, 2024

राजस्व अनुभाग-10

विषयः-राज्य आपदा न्यूनीकरण निधि के अन्तर्गत आपदाओं के प्रभाव को न्यूनीकृत किये जाने हेतु अनुमन्य कार्यों का विवरण प्रेषित करने के सम्बन्ध में।

महोदय,

भारत सरकार एवं राज्य सरकार द्वारा अधिसूचित आपदाओं के प्रभाव को न्यूनीकृत किये जाने हेतु भारत सरकार द्वारा राष्ट्रीय आपदा न्यूनीकरण निधि (एन.डी.एम.एफ.) एवं राज्य आपदा न्यूनीकरण निधि (एस.डी.एम.एफ.) के अन्तर्गत कराये जाने वाले कार्यों के सम्बन्ध में विस्तृत दिशा-निर्देश निर्गत किये गये हैं।

2- उल्लेखनीय है कि राज्य आपदा न्यूनीकरण निधि में पर्याप्त धनराशि उपलब्ध है और विभागों से भारत सरकार की उक्त गाइडलाइन के अनुसार राज्य आपदा न्यूनीकरण निधि से वित्त पोषण हेतु प्रस्ताव प्राप्त नहीं हो रहे हैं। मुख्य सचिव, उ0प्र0 शासन की अध्यक्षता में दिनांक 05.07.2024 को सम्पन्न राज्य आपदा प्रबन्धन की राज्य कार्यकारिणी समिति की बैठक में राज्य आपदा न्यूनीकरण निधि में अधिक धनराशि उपलब्ध होने के दृष्टिगत सभी विभागों को भारत सरकार की एस0डी0एम0एफ0 की गाइडलाइन के अनुसार प्रस्ताव बनाकर राजस्व विभाग को उपलब्ध कराने तथा अनुमन्य कार्यों से सम्बन्धित गाइडलाइन की प्रति सभी विभागों को परिचालित करने के निर्देश दिये गये हैं।

अवगत कराना है कि भारत सरकार द्वारा निर्गत उक्त दिशा-निर्देशों की प्रति राजस्व अनुभाग-11 के पत्र संख्या-आई0/444242/2023, दिनांक 11.12.2023 एवं पत्र संख्या-आई0/421905/2023, दिनांक 06.11.2023 द्वारा पूर्व में भी प्रेषित की गयी है।

3- अतः राज्य कार्यकारिणी समिति द्वारा दिये गये निर्देश के दृष्टिगत पुनः भारत सरकार के पत्र संख्या-33-02/2020-NDM-I, दिनांक 14-01-2022 द्वारा परिचालित राज्य आपदा न्यूनीकरण निधि की गाइडलाइन तथा राज्य आपदा न्यूनीकरण निधि की परियोजनाएं तैयार किये जाने सम्बन्धी दिशानिर्देश का संलग्नक-1 एवं भारत सरकार के पत्र संख्या-33-02/2020-NDM-I(Pt)-1513-1514, दिनांक 16-10-2023 द्वारा निर्गत Indicative List of Mitigation Activities under NDMF/SDMF की प्रति इस आशय से प्रेषित है कि विभिन्न आपदाओं के प्रभाव को न्यूनीकृत किये जाने हेतु राज्य आपदा न्यूनीकरण निधि

से वित्त पोषित किये जाने हेतु उक्त दिशा-निर्देशों के अनुरूप सम्बन्धित कार्यों हेतु प्रस्ताव/परियोजना तैयार कराकर प्रशासकीय विभाग के माध्यम से राजस्व विभाग को अतिशीघ्र उपलब्ध कराने का कष्ट करें।

संलग्नकः-यथोक्त।

भवदीय,

(पी. गुरू प्रसाद)
प्रमुख सचिव।

संख्या व दिनाँक तदैव।

प्रतिलिपि निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

1. राहत आयुक्त, उत्तर प्रदेश।
2. अपर मुख्य कार्यपालक अधिकारी, उ.प्र. राज्य आपदा प्रबन्धन प्राधिकरण, लखनऊ।
3. राजस्व अनु-1/गाई दुत

आज्ञा से,

(शैलेन्द्र मणि त्रिपाठी)
अनु सचिव।

Immediate

No. 33-02/2020-NDM-I
Government of India
Ministry of Home Affairs
(Disaster Management Division)

'C' Wing, 3rd Floor, NDCC- II,
Jai Singh Road, New Delhi-110001,
Dated the 14th January 2022

To,

The Chief Secretaries
(All States).

Subject: - Guidelines on Constitution and Administration of the State Disaster Mitigation Fund (SDMF) based on the recommendations of the Fifteenth Finance Commission 2021-22 to 2025-26.

Sir/ Madam,

The Fifteenth Finance Commission (FFC) has made provision of funds for the State Disaster Mitigation Fund in its recommendations which has been accepted by the Government of India. Keeping in view of the provision of the Disaster Management Act, 2005 and the recommendations of Fifteenth Finance Commission, Government of India has framed guidelines for administration of State Disaster Mitigation Fund at the State level, which are enclosed herewith for necessary action.

2. A copy of the guidelines for SDMF are enclosed for further necessary action at your end. These guidelines can also be downloaded from website of Disaster Management Division of Ministry of Home Affairs i.e. www.ndmindia.mha.gov.in .

(Pawan Kumar)
Deputy Secretary (DM-I)
Telefax: 23438123

Encl: As above.

Copy to:-

1. Ministry of Finance, Department of Expenditure, North Block, New Delhi.
2. Ministry of Agriculture [Joint Secretary (DM)], Krishi Bhawan, New Delhi.
3. National Disaster Management Authority, New Delhi.
4. Relief Commissioners/ Secretaries, Department of Disaster Management of (All States).
5. Accountants General of all State Governments.
6. Controller General of Accounts (CGA), New Delhi.
7. Comptroller & Auditor General (CAG), New Delhi.

*****

Ministry of Home Affairs
(Disaster Management Division)

Guidelines on Constitution and Administration of the State Disaster Mitigation Fund (SDMF)

Introduction:

The Disaster Management Act, 2005 (hereinafter called as DM Act, 2005) defines mitigation as 'measures aimed at reducing the risk, impact or effects of a disaster or threatening disaster situation'.

2. The State Disaster Mitigation Fund (SDMF) is constituted under the section 48 (1) (c) of the DM Act, 2005. This fund is exclusively for the purpose of mitigation projects in respect of disasters covered under the State Disaster Response Fund (SDRF)/ National Disaster Response Fund (NDRF) Guidelines and the State specific local disasters notified by the State Governments. The Mitigation Fund shall be used for those local level and community-based interventions, which reduce the risks and promote environment-friendly settlements and livelihood practices. Large-scale mitigation interventions such as construction of coastal walls, flood embankments, support for drought resilience etc. shall be pursued through the regular development schemes and not from the mitigation fund.

3. Mitigation measures can be structural and non- structural.

Structural measures: Structural mitigation measures include any physical construction to reduce or avoid possible impacts of hazards, or the application of engineering techniques or technology to achieve hazard resistance and resilience in structures or systems. These measures attempt to strengthen buildings to better endure future disasters like cyclones and earthquakes.

Non-Structural measures: It does not involve physical construction but use knowledge, practices, policies, laws/Regulations, public awareness-raising, training and education etc. e.g. Building codes and Laws, location specific planning/strategies, forest management/restoration of mangroves, awareness campaigns etc.

4. These guidelines are issued under Section 62 of the DM Act, 2005 and shall be called 'State Disaster Mitigation Fund' (SDMF) guidelines and will be operative from the financial year 2021-22 to 2025-26, and will continue till further orders.

5. **Technical Guidelines:**

For the guidance of the State Governments, the National Disaster Management Authority (NDMA) will issue technical guidelines separately, within the broad framework of these guidelines and with the concurrence of MHA. Further, Hazard specific mitigation guidelines and detailed procedures for project execution will continue to be issued by NDMA from time to time in consultation with MHA.

6. Long Term Mitigation Strategy:

At the national and state level, the Disaster Management Authorities will conduct the risk assessment, which presents an assessment of hazards, exposure and vulnerability and their likely impacts. Based on the risk assessment, the Disaster Management Authorities will prepare long-term mitigation strategy for their respective jurisdictions.

7. State Disaster Mitigation Fund (SDMF):

7.1 SDMF will be constituted with the nomenclature of "State Disaster Mitigation Fund" in the Public Account under the Reserve Fund bearing interest in the Major Head: 8121-General and other Reserve Funds-130-'State Disaster Mitigation Fund' in the accounts of the State Governments concerned after fulfilling all codal and other accounting formalities required.

7.2 The closing balance as on 31.03.2021 in the SDMF shall become the opening balance for 2021-22. Unless otherwise provided, closing balance of each financial year would be the opening balance for the next financial year till 2025-26.

7.3 The State Government shall invest SDMF as per the provisions of para-12 of these guidelines. The State Government shall pay interest into the SDMF at the rate applicable to overdrafts under Overdraft Regulation Guidelines of the RBI for the amount not invested from SDMF. The interest will be credited on a half-yearly basis.

7.4 SDMF will be operated by the State Executive Committee (SEC) in consultation with State Disaster Management Authority (SDMA) with an objective to release Grants- in- aid for mitigation projects in their jurisdiction.

7.5 SDMF will be applied by SDMA for appraisal, monitoring and supervision of the mitigation projects.

8. Contribution/Allocation to the SDMF:

8.1 The 15th Finance Commission (XV-FC) has recommended Rs.32,031 crore [20%of State Disaster Risk Management Fund (SDRMF) of Rs.1,60,153 crore] for SDMF of States for the period 2021-22 to 2025-26. The state-wise details of the annual allocations for the period from 2021-22 to 2025-26 is given in Annexure-I.

8.2 The Central Government will contribute 75% funds of SDMF for all States, except for the North-Eastern and Himalayan (NE & H) States, for which it will contribute 90% of the total annual allocation. The balance 25% of funds of SDMF will be contributed by the State Governments concerned, except the NE & H State, which shall contribute 10%.

8.3 The Central Government shall pay its share as Grants-in-aid to the States under the Major Head "3601-Grants-in-aid to State Governments-07 Finance Commission Grants-105 "General (Relief on Account of Natural Calamities)-Disaster Mitigation". The State Governments shall take these as receipts in their budget and account under the Major Head "1601-Grants-in-aid from Central Government-07 Finance Commission Grants-105 "Grants in aid for State Disaster Mitigation Fund".

8.4 In order to enable transfer of the total amount of contribution to the SDMF (both Central share and the State share of contribution), the State Governments would make suitable budget provision on the expenditure side of their budget under the Head "2245- Relief on Account of Natural Calamities-08-State Disaster Mitigation Fund-797-Transfers to Reserve Fund and Deposit Accounts".

8.5 Immediately upon the receipt of Central Government's share as per para-8.3 above, the States would transfer the amount, along with their share, if not already transferred, to the Public Accounts Head within 15 days of its receipt. Any delay will require the State Government to release the amount, with interest, at Bank rate of RBI, for the number of days of delay. The State Government is required to endorse the copy of the release order to the Department of Expenditure, Ministry of Finance and Ministry of Home Affairs.

8.6 In order to have the real time information about availability of SDMF and NDMF fund with the State Governments, the Ministry of Home Affairs has evolved a web-based online application, i.e. National Disaster Management Information System (NDMIS). Therefore, State Governments will provide online data of expenditure incurred from SDMF (including additional central assistance from NDMF) in line with the Central Government's approved norms, on a real time basis. This is also in line with recommendation of XV-FC in para-8.112 of their Report.

8.7 State Governments can mobilize and pool funds in SDMF from various other sources viz. reconstruction bonds, contingent credit/standby facilities with international financial institutions, counterpart funding from Implementing Partners, crowd funding platforms and Corporate Social Responsibility (CSR) window etc.

8.8 State Governments should allocate resources to Districts for preparedness and mitigation on an annual basis following a methodology that they may evolve. In subsequent allocations, the State Governments may consider the expenditure incurred by the Districts under mitigation fund in previous years.

9. Scope of State Disaster Mitigation Fund (SDMF):

SDMF will fund mitigation projects at the State level. It will support and fund the following types of projects:

i) All projects relating to mitigation measures: (a) for the notified disasters by the Government of India namely cyclone, drought, earthquake, fire, flood, tsunami, hailstorm, landslide, avalanche, cloud burst, pest attack and frost & cold wave; and (b) for the 'disasters' notified by the State Government within the local context in the State, which are to be completed within the geographical jurisdiction of the State, will be funded from the SDMF.

ii) The State Government may use up to 10% fund of the annual allocation of the SDMF for the purpose of mitigation projects in respect of disasters that they consider to be 'disasters' within the local context in the State as notified under SDRF guidelines.

iii) Projects which are of State-level significance, protecting assets, eco-systems and settlements within the State.

iv) Projects which promote practices to reduce disaster risks and its impacts.

v) Projects which build community resilience through information and knowledge.

vi) Projects which focus on creating safe conditions of living for people from weaker socio-economic categories, people with disabilities, and women.

vii) Regional projects which are initiated from the National Disaster Mitigation Fund (NDMF).

viii) Research and studies related to disaster mitigation through the small grants window.

ix) In case of flood mitigation projects, States should undertake the following non-structural measures:

a) Adopting Integrated Flood Management approach by considering river basin as a hydrological unit.

b) Real Time Hydro-meteorological Data Acquisition Network coupled with Decision Support System for integrated or standalone operation of reservoir(s), as the case may be.

c) Delineation and demarcation of flood plain zones on certain notified stretch (es) of river(s) within the State and regulation of various activities permissible therein.

10. **Limitation for utilization of SDMF:**

i) At least 10% of the SDMF each year should be earmarked for the non-structural measures. (Components of non-structural measures in projects consisting of both the kinds of measures may be counted towards this limit).

ii) In a year, not more than 50% of SDMF may be utilized for measures/projects to mitigate risks from a single hazard. However, this stipulation may be relaxed by the Ministry of Home Affairs on the recommendations of Sub Committee of National Executive Committee (SC-NEC), based on the written request of the State with proper justification.

iii) In a year up to 5% of the SDMF, funds may be earmarked for small grants window to support small proposals related to innovation, technology, community leadership, research, studies and learning. The NDMA and the SDMA will devise a mechanism to fund projects from this window.

iv) Funds available under SDMF shall not be used for general environmental improvement or landscape beautification and for funding the existing Government programmes/ongoing schemes etc.

v) Mitigation Fund should generally not be used for maintenance and upkeep of any structure or engineering measure aimed at mitigation. This fund should be used for developing and implementing new projects. The mitigation measures that have been implemented, should be maintained through other sources of funding.

vi) Resources under Mitigation Fund cannot be used towards the establishment expenditure such as salaries, office expenditure etc. to be incurred by the Disaster Management Authorities or other entities, except for payment of remuneration to technical staff included in the projects costs. Such payments will be as per the GFR-2017 and extant Government of India guidelines.

11. Release of Central Contribution to the SDMF:

The Central share to the SDMF shall be remitted to the State Governments in two equal installments in June and December in each financial year. Likewise, the State Governments shall also transfer their contribution to SDMF in two equal installments in June and December of the same year, provided that if Ministry of Home Affairs, upon being satisfied on the need of the State, may recommend an earlier release of the Central share of a particular year's installment.

The Central share to the SDMF due in a year shall be released to the State Governments subject to fulfillment of the following conditions:-

i) State Governments are required to issue a certificate that the relevant notification, establishing SDMF as per section 48(1)(c) of the DM Act, 2005 is in force.

ii) The State Government shall furnish a certificate to MHA and to Ministry of Finance in the months of April and October every year indicating that the amount received earlier has been credited to the SDMF along with the State's share of contribution, accompanied by the statement giving the up-to-date expenditure and the balance amount available in the SDMF. This statement is to be provided in the format at Annexure-II.

iii) Once the Finance Accounts of the previous year are available, expenditure reported for that particular year should match with expenditure figure in Major Head: 2245 and balance in SDMF in MH: 8121 . In case of any discrepancy, the figures in MH: 2245 and in MH: 8121 as reflected in the Finance Accounts will be considered. Any deviation from prescribed accounting practices in the guidelines would result in withholding of further releases until the required accounting procedure is adopted or restored.

iv) The Central Government's contribution due in December of a year shall be released after the receipt, in MHA and in Ministry of Finance, by September of that year, of an 'Annual Report on Mitigation Projects', prepared by the State Government. This Annual Report shall, inter-alia, furnish details of expenditure incurred by the State Government on each of the mitigation project in the format to be laid down in due course.

v) The Central Government's share shall be released by the Department of

Expenditure, Ministry of Finance after receiving due recommendations from MHA.

12. **Investment of SDMF:**

12.1 The accretions to the SDMF together with the income earned on the investments of the SDMF shall, till contrary instructions are issued by the Central Government, be invested in one or more of the instruments such as Central Government dated Securities; Auctioned Treasury Bills; and interest earning deposits and certificates of deposits with Scheduled Commercial Banks.

12.2 The investments of the funds shall be carried out by the branch of the Reserve Bank of India (having Banking Department) at the headquarters of the State, or a Bank designated by RBI. In case of Sikkim, the functions may be carried out by the State Banker. The accounting procedure for the investment transactions and encashment of securities will be similar as available in case of SDRF.

12.3 State Executive Committee (SEC) shall ensure that SDMF shall be invested as per provisions of Para-12.1of these guidelines. The State Government shall pay interest for the amount not invested from the SDMF, in the identified interest bearing instruments at the rate applicable to overdrafts under Overdraft Regulation Guidelines of the RBI. The interest will be credited on a half-yearly basis into the SDMF corpus.

13. **Administrative mechanism to be followed for processing of proposals under SDMF.**

(i) The SDMA will constitute an Appraisal Committee to be headed by a Member of SDMA with members from line Departments of the State Government and State entities for appraisal of the proposals/ projects under SDMF.

(ii) The Departments/ Agencies of the State Government/ DDMA, who wish to take up projects from SDMF, will submit the project proposals to the State Government Department dealing with the Disaster Management, which in turn will refer the project proposal to the Committee headed by the Member, SDMA for appraisal.

(iii) The recommendations of the Appraisal Committee of SDMA shall be placed before the SEC for consideration/ sanction.

14 **State Executive Committee (SEC):**

i) SEC, constituted by the State Government as per provision of section 20 of the DM Act, 2005, will decide on matters connected with the administration of SDMF including obtaining contributions from the Central Government, investing the accretions to the SDMF in accordance with the prescribed norms and approving the mitigation project from SDMF.

ii) SEC shall ensure that the money drawn from SDMF is actually utilized for the purpose for which the SDMF has been set up.

15 **Release of Funds:**

Upon sanction of projects by SEC, funds will be released from SDMF for mitigation projects/ works. Procedure as in vogue in the State for the release of funds under SDRF shall apply to SDMF also.

16. Unspent balance in the SDMF:

The unspent balance in the SDMF account as at the end of the financial year 2021-22 shall be the opening balance of SDMF account of the financial year 2022-23. The Central Government will communicate the modalities for handling any balances available at the end of 2025-26 in SDMF of the State.

17. Execution of Projects:

SDMA shall supervise and monitor the approved projects during implementation and will be responsible for submitting completion certificates as well as required reports, including maintaining updated database containing information about all projects implemented with the assistance from SDMF/NDMF.

18. Accounts and Audit:

i. The State's SDMF account should distinctly show source of receipt into funds namely:
   a. Centre's share of SDMF
   b. State's share of SDMF
   c. Return on investments
   d. Redemption of investments
   e. Contribution from reconstruction bond, CSR/ Implementing partners/ community etc., if any.
   f. Penal Interest (at bank rate or overdraft rate as the case maybe)

ii. The actual expenditure out of SDMF should be booked under respective Minor Heads within Major Head 2245.

iii. The detailed accounts of fund and investment thereof shall be maintained by Accountant General In-charge of Accounts of the State.

iv. The accounts of SDMF shall be audited annually by Comptroller & Auditor General. The State Government shall furnish a copy of the audit Report of CAG to Ministry of Finance and Ministry of Home Affairs.

19. Developing a Disaster Database:

NDMA shall develop a disaster database as a special initiative. The database should have disaster assessments, the details of allocations and expenditure and preparedness and mitigation plans. The database of the projects includes all the details related to project components, expenditure, reviews, evaluation and outcome.

20. Outcome Framework:

Projects taken up from SDMF must have verifiable and measurable outcomes. NDMA shall develop an outcome framework to ensure a greater accountability for allocation and utilization of NDMF/SDMF resources. This framework could be based on achieving the Sendai Framework indicators which may include reducing mortality, supporting community recovery and resilience and improving the quality and substance of disaster assistance. The set of indicators may be determined by NDMA.

21. Procurement of Goods and Services:

All procurements required for implementing the approved projects shall be made by the Government agencies for implementing the proposal in accordance with the latest General Financial Rules (GFR) and from GeM portal.

22. Savings:

i. In case of any difficulty in interpretation of any of these guidelines, the matter shall be referred to MHA, whose decision shall be final.

ii. MHA, with the concurrence of Ministry of Finance, may amend these guidelines, in such a manner as may be required to facilitate smooth operation of immediate mitigation measures.

iii. MHA is the nodal Ministry for overseeing the operation of SDMF and shall monitor compliance with the prescribed processes. MHA may issue directions/ instructions under the DM Act, 2005 in this regard.

*****

Annexure-I

State-wise allocation of funds under State Disaster Mitigation Fund 2021-22 to 2025-26

Sl.	Name of State	State share (Rs in crore)						Central share (Rs in crore)						Total (Central and State share) (Rs in crore)					
		2021-22	2022-23	2023-24	2024-25	2025-26	Total	2021-22	2022-23	2023-24	2024-25	2025-26	Total	2021-22	2022-23	2023-24	2024-25	2025-26	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1.	Andhra Pradesh	74.50	78.30	82.20	86.30	90.60	411.90	223.50	234.90	246.60	258.90	271.80	1235.70	298.00	313.20	328.80	345.20	362.40	1647.60
2.	Arunachal Pradesh	5.60	5.84	6.14	6.42	6.76	30.76	50.40	52.56	55.26	57.78	60.84	276.84	56.00	58.40	61.40	64.20	67.60	307.60
3.	Assam	17.20	18.02	18.92	19.88	20.86	94.88	154.80	162.18	170.28	178.92	187.74	853.92	172.00	180.20	189.20	198.80	208.60	948.80
4.	Bihar	94.50	99.15	104.05	109.25	114.75	521.70	283.50	297.45	312.15	327.75	344.25	1565.10	378.00	396.60	416.20	437.00	459.00	2086.80
5.	Chhattisgarh	28.75	30.25	31.75	33.35	35.00	159.10	86.25	90.75	95.25	100.05	105.00	477.30	115.00	121.00	127.00	133.40	140.00	636.40
6.	Goa	0.75	0.80	0.80	0.85	0.95	4.15	2.25	2.40	2.40	2.55	2.85	12.45	3.00	3.20	3.20	3.40	3.80	16.60
7.	Gujarat	88.25	92.65	97.30	102.20	107.25	487.65	264.75	277.95	291.90	306.60	321.75	1462.95	353.00	370.60	389.20	408.80	429.00	1950.60
8.	Haryana	32.75	34.40	36.10	37.90	39.80	180.95	98.25	103.20	108.30	113.70	119.40	542.85	131.00	137.60	144.40	151.60	159.20	723.80
9.	Himachal Pradesh	9.10	9.52	10.02	10.50	11.04	50.18	81.90	85.68	90.18	94.50	99.36	451.62	91.00	95.20	100.20	105.00	110.40	501.80
10.	Jharkhand	37.75	39.70	41.70	43.85	46.00	209.00	113.25	119.10	125.10	131.55	138.00	627.00	151.00	158.80	166.80	175.40	184.00	836.00
11.	Karnataka	52.75	55.35	58.10	61.00	64.05	291.25	158.25	166.05	174.30	183.00	192.15	873.75	211.00	221.40	232.40	244.00	256.20	1165.00
12.	Kerala	21.00	22.00	23.10	24.25	25.50	115.85	63.00	66.00	69.30	72.75	76.50	347.55	84.00	88.00	92.40	97.00	102.00	463.40
13.	Madhya Pradesh	121.25	127.40	133.80	140.50	147.50	670.45	363.75	382.20	401.40	421.50	442.50	2011.35	485.00	509.60	535.20	562.00	590.00	2681.80
14.	Maharashtra	214.75	225.55	236.80	248.65	261.05	1186.80	644.25	676.65	710.40	745.95	783.15	3560.40	859.00	902.20	947.20	994.60	1044.20	4747.20
15.	Manipur	0.90	0.98	1.04	1.10	1.14	5.16	8.10	8.82	9.36	9.90	10.26	46.44	9.00	9.80	10.40	11.00	11.40	51.60
16.	Meghalaya	1.50	1.52	1.62	1.68	1.78	8.10	13.50	13.68	14.58	15.12	16.02	72.90	15.00	15.20	16.20	16.80	17.80	81.00
17.	Mizoram	1.00	1.08	1.16	1.20	1.26	5.70	9.00	9.72	10.44	10.80	11.34	51.30	10.00	10.80	11.60	12.00	12.60	57.00
18.	Nagaland	0.90	0.96	1.02	1.06	1.12	5.06	8.10	8.64	9.18	9.54	10.08	45.54	9.00	9.60	10.20	10.60	11.20	50.60
19.	Odisha	107.00	112.30	117.90	123.80	130.00	591.00	321.00	336.90	353.70	371.40	390.00	1773.00	428.00	449.20	471.60	495.20	520.00	2364.00
20.	Punjab	33.00	34.65	36.40	38.20	40.15	182.40	99.00	103.95	109.20	114.60	120.45	547.20	132.00	138.60	145.60	152.80	160.60	729.60
21.	Rajasthan	98.75	103.70	108.90	114.30	120.00	545.65	296.25	311.10	326.70	342.90	360.00	1636.95	395.00	414.80	435.60	457.20	480.00	2182.60
22.	Sikkim	1.10	1.18	1.24	1.30	1.36	6.18	9.90	10.62	11.16	11.70	12.24	55.62	11.00	11.80	12.40	13.00	13.60	61.80
23.	Tamil Nadu	68.00	71.40	75.00	78.75	82.65	375.80	204.00	214.20	225.00	236.25	247.95	1127.40	272.00	285.60	300.00	315.00	330.60	1503.20
24.	Telangana	30.00	31.45	33.00	34.70	36.40	165.55	90.00	94.35	99.00	104.10	109.20	496.65	120.00	125.80	132.00	138.80	145.60	662.20
25.	Tripura	1.50	1.58	1.68	1.76	1.86	8.38	13.50	14.22	15.12	15.84	16.74	75.42	15.00	15.80	16.80	17.60	18.60	83.80
26.	Uttar Pradesh	129.00	135.35	142.10	149.25	156.70	712.40	387.00	406.05	426.30	447.75	470.10	2137.20	516.00	541.40	568.40	597.00	626.80	2849.60
27.	Uttarakhand	20.80	21.86	22.96	24.10	25.30	115.02	187.20	196.74	206.64	216.90	227.70	1035.18	208.00	218.60	229.60	241.00	253.00	1150.20
28.	West Bengal	67.50	70.80	74.35	78.00	81.95	372.60	202.50	212.40	223.05	234.00	245.85	1117.80	270.00	283.20	297.40	312.00	327.80	1490.40
	Total	**1359.85**	**1427.74**	**1499.15**	**1574.10**	**1652.78**	**7513.62**	**4437.15**	**4658.46**	**4892.25**	**5136.30**	**5393.22**	**24517.38**	**5797.00**	**6086.20**	**6391.40**	**6710.40**	**7046.00**	**32031.00**

Annexure-II

PROFORMA

Statement containing State's share of contribution, up-to-date expenditure and the balance amount available in the State Disaster Mitigation Fund (SDMF)

(Rs in Lakhs)

(A) Statement of previous released amounts to the SDMF/NDMF:

1. Opening balance as on 01.04.20..... : _____
2. Centre share including advance release credited to SDMF : _____
3. Correspondence share of State : _____
4. Correspondence share of State credited to SDMF : _____
5. Amount received under NDMF : _____
6. Expenditure as on 30th September..... : _____
7. Expenditure as on 31st March, 20..... : _____
8. Amount transferred to investment account : _____
9. Amount received from investment account : _____
10. Closing balance (1+2+4+5+9) – (7+8): 31st March/ 30th September : _____

(B) 1. Opening balance: 1st March/ 1stOctober 20 ..... : _____

1.1 Total investment made out of SDMF as on 31stMarch, 20.. : _____

2. Receipt during the current financial year..... : _____

i. Centre's share (date of receipt from Govt. of India)
ii. State's share..... : _____
iii. Assistance under NDMF:..... : _____
iv. Date of transfer of Centre's and State's share to SDMF account:.: _____
v. Interest paid to the SDMF account in case of delay of transfer of funds beyond 15 days : _____
vi. Interest earned (including investment made out of SDMF) : _____
vii. Others : _____
viii. Arrears of Centre's/State's share, if any: (to be credited to SDMF) : _____
ix. Total (i) to (viii) : _____
x. Of which amount credited to SDMF : _____

3. Total amount available in the SDMF {1+2(x)} : _____

4. Total expenditure incurred inconformity with items & norms of SDMF during the year out of the Fund:

(i) As on 31st March, 20..... : _____
(ii) As on 30th September, 20..... : _____

(Expenditure Statement is to be provided in the proforma as given at Appendix)

5. Balance available in the Fund(3-4).....31st March/ 30th September

(C) Submission of Annual Report of Mitigation Projects:

(i) Whether "Annual Report on Mitigation Projects/ Activities" for the previous year has been sent to Ministry of Home Affairs (Yes/ No). : _____
(ii) If yes, date on which sent..... : _____

Appendix

PROFORMA

State: _____

Earmarked project wise expenditure details from funding window of NDMF

S No.	Project	Catalytic assistance to twelve most drought-prone State (1,200 Crore)			Balance amount available as on 31 March/ 30 Sept 20.....	Project	Managing seismic and landslide risks in the ten Hill State (750 Crore)			Balance amount available as on 31 March/ 30 Sept 20.....
		Receipts during the year		Expenditure			Receipts during the year		Expenditure	
		Central Share (90 %)	State Share (10 %)				Central Share (90 %)	State Share (10 %)		
1	2	3	4	5	6	7	8	9	10	11

S No.	Project	Reducing Risk of urban flooding is seven most populous cities (2,500 Crore)			Balance amount available as on 31 March/ 30 Sept 20.....	Project	Mitigation measures to prevent erosion (1,500 Crore)			Balance amount available as on 31 March/ 30 Sept 20.....
		Receipts during the year		Expenditure			Receipts during the year		Expenditure	
		Central Share (90 %)	State Share (10 %)				Central Share (90 %)	State Share (10 %)		
1	2	3	4	5	6	7	8	9	10	11

Note:- Expenditure to be incurred from SDMF account should be as per the approved norms & guidelines issued by the Union Government.

सत्यमेव जयते

Guidelines For Preparation of Disaster Mitigation Projects under DISASTER MITIGATION FUND (NDMF & SDMF)

NATIONAL DISASTER MANAGEMENT AUTHORITY

Table of Contents

Executive Summary

The technical guidelines for mitigation are framed in addition to the operational guidelines for the constitution and administration of the NDMF and SDMF, which needs to be followed by the National Disaster Management Authority (NDMA), State Disaster Management Authorities (SDMAs), and implementing agencies, and other project proponents. The Mitigation guidelines aim to set up a national mitigation system. All mitigation projects developed and implemented would be part of the national mitigation system. The guidelines are organized into four chapters. The first two chapters deal with the conceptual and policy aspects of mitigation. The remaining chapters deal with details of the mitigation funds and project formulation.

The Mitigation Fund Guidelines of NDMF and SDMF apply to:

- All disasters recognized under the norms/guidelines of the National Disaster Response Fund
  (NDRF) State Disaster Response Fund (SDRF)
- The Mitigation Fund shall be used for local level and community-based interventions
- Any potential hazard or event deemed to be incorporated for mitigation or notified by the National (MHA) and/or State Disaster Management Authority

Chapter one of the guidelines enunciates the concepts of Hazard, Vulnerability, and Risk Exposure in the Indian Context. The dynamics of a disaster change rapidly when potential risk factors are influenced by external risk factors such as poverty, inequality, climate change, unplanned urbanization, and environmental degradation.Such external drivers of risks need to be addressed through appropriate mitigation measures including a combination of structural and non-structural solutions. The existing policies have addressed mitigation as part of the disaster management cycle.

The Disaster Management Act, 2005 suggests that the National, State, and District Disaster Management Plans and all development plans should integrate mitigation measures to reduce the effects of disasters. Section 47 and 48 of the DM Act lays down the provision for the constitution of National, State, and District Disaster Mitigation Funds. Further, under sections 47 and 62 of the Act, National Disaster Mitigation Fund (NDMF) and State Disaster Mitigation Fund (SDMF)

guidelines will be operative from the financial year 2021-22 to 2022-26, and will continue till further orders.

The National Policy on Disaster Management emphasizes a multi-pronged approach to integrating mitigation measures into all development projects, initiating national-level mitigation projects by the NDMA, encouraging State-level mitigation projects, and giving due weightage to indigenous knowledge on disaster and coping mechanisms.

The National Disaster Management Plan (NDMP) refers to mitigation as a composite of structural and non-structural measures. The Plan suggests developing a techno-legal regime to facilitate mainstreaming disaster risk reduction into development activities, which include socio-economic development and poverty alleviation.

Sendai Framework for Disaster Risk Reduction (2015–2030): Under this, India would develop interventions to invest in disaster risk reduction for resilience as part of mitigation measures.

Chapter 2 illustrates the linkage of disaster mitigation with development planning, the disaster management cycle, and its relationship with other phases like preparedness or recovery. Besides providing details of these concepts, this chapter also emphasizes the commonalities and differences between disaster mitigation, climate change mitigation, and adaptation. Efforts in reducing hazard exposure and vulnerabilities through a systematic process will significantly reduce the demand for resources for disaster response or recovery. The integration of mitigation guidelines into development planning would provide a substantive scope for addressing the challenges arising due to recurring hazards such as earthquake, floods, drought, cyclone, tsunamis, landslides, glacial outbursts, urban floods, forest fire, soil erosion, lightning, hailstorm, heat wave, cold wave, etc. Because of this, mitigation strategies need to consider the following areas:

a) All proposed development activities should have a long term DRR impact in the region and take into account the impact on the most vulnerable sections of society.
b) Climate change mitigation measures may include reducing the emission of greenhouse gases.

b) Climate change adaptation measures may include moderating the impacts of hydro-meteorological hazards. These adaptation measures may include water conservation, plantations, diversified livelihoods, alternative cropping, and low-carbon housing.

c) Structural measures may include modifying existing structures and infrastructure to protect them from any structural damage.

d) Non-Structural measures may include

- localization of mitigation concepts in a specific region or for a particular community.
- Building Codes and Laws to ensure that structures resist the physical impacts of disasters.
- Providing financial protection to people, and preventing negative economic hardship after a disaster.
- Preserving the function of natural systems e.g. sedimentation and erosion control, forest management, restoration of mangroves, restoration of wetlands, lakes, etc.
- Informing and educating citizens, elected officials, property owners, and various other stakeholders about hazards and the importance of mitigation.

To integrate mitigation strategies, five essential steps need to be followed in every programme:

a) Determining nature and extent of risk by analyzing potential hazards and identifying the geographical area, assessing magnitude and severity of hazards, and estimating the impacts, past, and future.
b) Identify the differential impact of disasters to identify the most affected communities/households.
c) Identifying development interventions about planning, policy changes, structural interventions, natural resource, and environmental improvements.
d) Supporting mitigation activities by cost-benefit analysis.
e) Implementing mitigation measures with community compliance.

The NDMA, SDMAs, and DDMAs may initiate the mitigation measures based on hazard identification and vulnerability/capacity analysis. The various central and state-level technical agencies may develop and implement these measures. The Panchayati Raj Institutions (PRI) and municipal governments may work with the communities to identify mitigation measures and pool their own resources for implementation. The NGOs, CSOs, and communities work with technical agencies, experts, and government officials to identify mitigation solutions and implement them.

Chapter 3 lays down details on developing the mitigation projects. The Disaster Management Authorities at different levels can develop and implement mitigation proposals in the areas which are related to the Mitigation Strategy for the concerned jurisdiction. The development of the

Mitigation Strategy and its implementation must be supported through adequate technical expertise and public consultations. The Mitigation Strategy needs to be formally approved by the NDMA/ States and placed in the public domain. The key principles that the Disaster Management Authorities need to follow for mitigation projects are as follows:

a) The projects should have a measurable impact on the communities in reducing their risks and improving their safety and living conditions.
b) Introduce solutions that bring new technologies and innovations.
c) An appropriate mitigation strategy should be an optimal combination of structural and non-structural interventions.
d) Advocate nature-based solutions and promote linkages with climate change adaptation.
e) Mitigation measures should promote cost-effective models of mitigation measures.
f) Promote community participation and social inclusion.
g) Encourage women's participation and leadership.
h) Value Indigenous Traditional Knowledge

Project cycle

- The project cycle begins with the design of projects, appraisal and approval, followed up with implementation, and the final stage of impact evaluation.
- Implementing partners from within the government and outside can submit their project proposals to the Mitigation Funds at different levels and request funding.
- Disaster Management Authorities at different levels can take up projects from respective mitigation funds.
- If the rationale for investment in mitigation can be established based on the expected impacts and cost-benefit analysis, a mitigation project can be proposed.
- The pre-feasibility check may be done by Project Appraisal Committees (PAC) constituted by NDMA/SDMA within 30 days from the submission of the proposal to understand the relevance of the project, financial viability, and technical feasibility.
- The implementing partner may prepare a Detailed Project Report (DPR). It would be a technical and financial document that lays down the project goals, activities, cost estimates, and intended impacts.
- All DPRs may be appraised by the Technical Appraisal Committee (TAC) for technical, financial, and social aspects of the project.
- The operational guidelines issued by the MHA for the NDMF and SDMF may govern the operation (approval, fund release, and utilization) of the NDMF and SDMF.
- The process of review and approval through the TAC and the NDMA/SDMA be completed within two months of the submission of the DPR.
- The Implementing Partner submits an implementation plan, and lays down the time frame for completion of all the project activities.

- The implementing partner would be responsible for the community, forests, wildlife parks, rivers, wetlands, and any other natural or environmental asset.
- The Disaster Management Authorities have the necessary authority to take suitable decisions if the mitigation project is delayed or implemented incorrectly.
- All the mitigation projects have a monitoring and evaluation plan formulated during the preparation of the DPR. Project Monitoring is conducted throughout the project implementation to measure the progress of the project towards achieving expected/planned objectives.
- NDMA may conduct an evaluation, including third party evaluation, of any project approved under NDMF / SDMF / DDMF and publish the findings on the mitigation portal.
- The Disaster Management Authorities may take up financial, technical, and social audits of the projects.
- The NDMA shall develop a National Mitigation Portal to streamline the process and bring more transparency through utilization of digital technology.

Chapter 4 explains the governance structure of the mitigation funds. Various elements of the governance structure are necessary to ensure the impact of the investment in mitigation projects and accountability in the utilization of funds.

Mitigation Project Management Division (MPMD)

- The NDMA/SDMAs may constitute the MPMD that may look into the overall monitoring and coordination of mitigation projects at the national, state,and district levels, and host a decision support system for all the investments in mitigation. The administrative and travel expenses of MPMDs may be met by NDMF/SDMF.

Technical Appraisal Committee (TAC)

- Appraise projects from the technical and social points of view
- Give recommendations to the authorities,
- Conduct technical review of sanctioned projects from mitigation funds
- Give recommendations for improvement of projects.

Project Appraisal Committee (PAC)

- Administrative, technical, and financial appraisal of the projects,
- Examine that the projects follow government guidelines and instructions
- Assist the Secretariat of Authority on any administrative or financial matters

Roster of consultants

- To support technical review and audit, documentation, and development of technical guidelines or any other technical support required to oversee the implementation of the project.

In the annexure, examples of a few hazard-specific mitigation measures are given to provide an idea about the small-scale / local community-level interventions of structural and non-structural measures to be covered under NDMF / SDMF. Also, the templates for the pre-feasibility check and preparation of Detailed Project Report (DPR) are given in the annexure for appraisal and approval of the projects received from project proponents.

Definitions

The definitions mentioned below are applicable in the context of disaster mitigation:

Capacities: The combination of all the strengths, attributes and resources available within a community, society or organization that can be used to achieve agreed goals.

Capacity Development: The process by which people, organizations and society systematically stimulate and develop their capacities over time to achieve social and economic goals, including through improvement of knowledge, skills, systems, and institutions.

Climate Change Adaptation: In human systems, the process of adjustment to actual or expected climate and its effects to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate change and its effects; human intervention may facilitate adjustment to expected climate change (IPCC 2012).

Climate Change: A change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forces, or to persistent anthropogenic changes in the composition of the atmosphere or land use (IPCC 2012).

Critical Facilities: The primary physical structures, technical facilities and systems which are socially, economically or operationally essential to the functioning of a society or community, both in routine circumstances and in the extreme circumstances of an emergency.

Disaster Management Authorities: The authorities created under the Disaster Management Act, 2005 at national, state and district levels. These authorities are responsible for planning, coordinating and implementing the disaster management measures per the guidelines laid down in the Act.

Disaster Management Cycle: It is a continuous process that moves through four temporal phases: a). Mitigation (the reduction or elimination of future risk); b). Preparedness (a practised state of readiness to respond); c). Response (an immediate reaction or relief that saves lives); and d. Recovery (the process of repair and restoration).

Disaster Risk Management: The systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities to lessen the adverse impacts of hazards and the possibility of disaster.

Disaster Risk: The potential disaster losses, in lives, health status, livelihoods, assets and services, which could occur to a particular community or a society in future.

Disaster: As per the National Disaster Management Act, 2005, "disaster" means a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or human-made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area.

Early Warning Systems: The set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare and to act appropriately and insufficient time to reduce the possibility of harm or loss.

Exposure: The situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas.

Hazard: A hazard is a process, phenomenon or human activity that may cause loss of life, injury or other health impacts, property damage, social and economic disruption or environmental degradation. Hazards may be natural, anthropogenic or socio-natural in origin (UNISDR, 2016).

Hazardous Event: The manifestation of a hazard in a particular place during a particular period.

Land-Use Planning: The process is undertaken by public authorities to identify, evaluate and decide on different options for the use of land, including consideration of long term economic, social and environmental objectives and the implications for different communities and interest groups, and the subsequent formulation of publishing plans that describe the permitted or acceptable uses.

Recovery: Decisions and actions taken after a disaster with a view to restoring or improving the pre-disaster living conditions of the stricken community, while encouraging and facilitating necessary adjustments to reduce disaster risk. Recovery (rehabilitation and reconstruction) affords an opportunity to develop and apply disaster risk reduction measures.

Reconstruction: The medium- and long-term rebuilding, sustainable restoration of resilient critical infrastructures, services, housing, facilities and livelihoods required for the full functioning of a community or a society affected by a disaster, aligning with the principles of sustainable development and "build back better", to avoid or reduce future disaster risk.

Rehabilitation: The restoration of basic services and facilities for the functioning of a community or a society affected by a disaster.

Resilience: The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions.

Retrofitting: Reinforcement or upgrading of existing structures to become more resistant and resilient to the damaging effects of hazards.

Risk Transfer: The process of formally or informally shifting the financial consequences of particular risks from one party to another, whereby a household, community, enterprise or State Authority will obtain resources from the other party after a disaster occurs, in exchange for ongoing or compensatory social or financial benefits provided to that other party.

Vulnerabilities: The conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.

Definition of Important Natural Hazards

Floods

Flooding can be defined as the overflow of water on dry land caused by the rising water level in an existing waterway such as a river, stream or a drainage ditch. Floods usually last for days or weeks, unlike flash floods. Flash floods are a sudden increase in the level of water which rips through riverbeds or mountain canyons sweeping everything on their way. It is caused by variable factors like incessant rain in less time, breakage of dam or levee or glacial lake outburst and can occur within minutes or a few hours.

Earthquake

An earthquake is a sudden release of energy that creates a movement in the earth's crust. Most earthquake-related property damage and deaths are caused by the failure and collapse of

structures due to ground shaking. The level of damage depends upon the extent and duration of the shaking.

Drought

Drought is a period of unusually constant dry weather that persists long enough to cause deficiencies in water supply (surface or underground). Droughts are slow-onset hazards, but, over time, they can severely affect crops, municipal water supplies, recreational resources, and wildlife.

Cyclone

Cyclones are considered to be one of the most violent forms of a storm in nature. It is a weather system that causes atmospheric disturbance in a low-pressure area and is usually accompanied by weather conditions like torrential rainfall and high-speed winds. Cyclones originate over the sea and hence majorly affect the coastal region.

Landslide

The movement of a mass of rock, debris, or earth down a slope by force of gravity is considered a landslide. Landslides occur when the slope or soil stability changes from stable to unstable, which may be caused by heavy rainfall, snow melt, earthquakes, storms, volcanic eruptions, erosion, fire, anthropogenic activities, erosion or a combination of these factors etc.

Urban Floods

In urban environments, farmland, vegetation and bare soil have been converted into built-up areas due to rapid development[1]. As a result, precipitation brought by seasonal weather, cyclones etc. produce excessive runoff water in developed areas where the water doesn't have anywhere to flow. This is known as urban flooding.

Tsunami

A tsunami is a series of great waves that are created by undersea disturbances, such as earthquakes or volcanic eruptions. As opposed to typical waves that crash at the shoreline, tsunamis bring a continuously flowing "wall of water" that has the potential to cause devastating damage in coastal areas immediately along the shore.

---

[1]Eldho, T.I., P.E. Zope, and A.T. Kulkarni. "Urban Flood Management in Coastal Regions Using Numerical Simulation and Geographic Information System." In *Integrating Disaster Science and Management*, 205–19. Elsevier, 2018. https://doi.org/10.1016/B978-0-12-812056-9.00012-9.

Soil Erosion

A slow-onset disaster, soil erosion affects all landforms. In agriculture, soil erosion refers to the "wearing away of a field's topsoil by the natural physical forces of water and wind or through forces associated with farming activities such as tillage."

Lightning

Lightning is a discharge of electrical energy that results from the buildup of positive and negative charges in a thunderstorm, which creates a "bolt" when the buildup of charges becomes strong enough.

Hailstorms

Hailstorms are a potentially damaging outgrowth of severe thunderstorms. Hailstorms frequently accompany thunderstorms, so their locations and spatial extents overlap. Hail can cause substantial damage to agriculture.

Forest Fire

Forest fire is any outdoor fire that is not controlled, supervised, or arranged. Forest fire probability depends on local weather conditions; outdoor activities such as camping, garbage / debris burning, and construction; and the degree of public cooperation with fire prevention measures. Forest fires can result in destruction of wild flora, fauna, life, property etc.

Heat Wave

Most dangerous of the natural hazards, heat wave or heat or hot weather is a period where abnormally high temperatures are measured for a region. It can last for several days and can have a substantial impact on society, including a rise in heat-related deaths.

Cold Wave

A cold wave is a weather phenomenon caused by cooling of air or invasion of very cold air over a large area. It can also be a long spell of excessively cold weather accompanied by high winds, blizzards or ice storms causing significant wind chills.

Chapter 1 - Introduction

1.1 Overview

India is categorized as one of the most disaster-prone countries in the world because of its geo-climatic conditions and a high degree of socio-economic vulnerability. During the last two decades, as per the Em-dat, the international database for disasters, India has faced more than 700 disaster events, which include hydro-meteorological, geophysical, and man-made disasters. As per a UNDRR publication, India suffered a whopping USD 79.5 billion economic loss due to climate-related disasters in the last 20 years.[2]

At the national level, there is a declining trend in disaster mortality due to improvements in early warning systems. Deaths due to cyclones and storms have reduced. Still, more than 2,000 people died due to floods and heavy rains during 2018 and 2019.[3] In addition to floods, local disasters such as lightning and heat wave cause more than 2,000 deaths every year. Instead of large-scale human deaths in big disasters, we see a trend of dispersed deaths across small disasters in different parts of the country.

1.2 Hazard, Vulnerability and Risk Exposure in the Indian Context

Almost the entire country is exposed to multiple hazards. **Hazard** is defined as the probability of experiencing a certain intensity of hazard (eg. earthquake, cyclone etc) at a specific location and is usually determined by an historical or user-defined scenario, probabilistic hazard assessment, or other method.[4]

India has five seismic zones, extending from Zone V which is seismically most active to Zone I. More than 58.6 per cent of the landmass is prone to earthquakes of moderate to very high intensity. Floods are the most frequent hazard, with many states experiencing it on annual basis. Over 40 million hectares (12%) of its land is prone to floods and river erosion. Droughts have also become very frequent, with 68 percent of cultivable area vulnerable to drought. India has a long coast line on both the eastern and western side. Close to 5,700 km, out of the 7,516 km. long coastline, is prone to cyclones. Its hilly areas are at risk from landslides and avalanches. Most of the states also deal with smaller disasters which include lightning, heat wave, hailstorm, cloudburst, etc. Moreover, India is also vulnerable to Chemical, Biological, Radiological and Nuclear (CBRN) emergencies and other man-made disasters.[5]

All the regions of India are exposed to risks of natural hazards. The Himalayan states experience earthquakes, landslides, floods and other mountain hazards such as GLOFs and avalanches.

---

[2] CRED and UNISDR, Economic Losses, Poverty and Disasters 1998-2017

[3] https://www.statista.com/statistics/1007056/india-number-of-deaths-due-to-natural-disasters/

[4] https://www.preventionweb.net/risk/disaster-risk

[5] https://ndma.gov.in/en/vulnerability-profile.html

States, which have major river basins, both in the Northern and Peninsular India, suffer losses almost every year due to floods and inundation. The States on the eastern coast are seriously affected by cyclones. A large area of northern India, particularly the state of Rajasthan and many Western and Southern states such as Gujarat, Maharashtra, Karnataka and Telangana, experience drought on a regular basis, which cause water shortages, crop losses and rural distress. The North-eastern States also have a similar hazard profile as the Himalayan states, except that Assam experiences riverine floods on a massive scale every year.

When these hazards affect areas and populations which are vulnerable, disaster events are triggered. It is the level of vulnerability which determines the impact of hazards. **Vulnerability** refers to the extent to which an individual, household or community is likely to suffer damage or disruption by the impact of a hazard event. It is socio-economic conditions which determine the levels of vulnerability and could be measured with different indicators, such as levels of poverty, lack of literacy and education, homelessness, etc. If certain individuals, households or communities do not fare well on these indicators, they are likely to experience a greater impact of hazard events.

The geographical area, population and the level of development of different geo-climatic regions and the increasing populations determine risk exposure and explain the distribution of disaster impacts across the country. **Risk Exposure** represents the stock of property and infrastructure within a particular region exposed to a hazard. States and cities which are growing faster and have accumulated more economic assets and infrastructure have a greater risk exposure. The risk exposure determines the level of damage and loss when a hazard event occurs.

1.3 External Drivers of Disaster Risks

Disasters are sometimes considered external shocks caused by hazards, but disaster risk results from the complex interaction between development processes that generate conditions of hazard, vulnerability and exposure. **Disaster risk** is therefore considered as the combination of the severity and frequency of a hazard, the numbers of people and assets exposed to the hazard, and their vulnerability to damage.[6]

Disaster risks are a dynamic phenomenon and they can change very rapidly as a result of the evolving nature of hazard, vulnerability and exposure. These constituent elements of a disaster are influenced by a number of factors, known as risk drivers. Poverty and inequality, climate change, unplanned urbanization, and environmental degradation are considered important risk drivers. In India, these risk drivers have contributed to a very high level of disaster risk.

Poverty is both a driver and consequence of disasters, and the processes that further disaster risk related poverty are permeated with inequality.[7] Disasters may affect poverty directly in many ways. Even when losses from disasters are small on average, some victims may lose everything

[6] Global Assessment Report on Disaster Risk Reduction 2015

[7] https://www.preventionweb.net/risk/poverty-inequality

during an event, including their health and, in the case of children, their chances of escaping poverty through education.[8] The poor are more at risk due to their houses and settlements located in unsafe locations, or their livelihoods threatened by disasters. The poorer groups find it difficult to recover from disasters, as they find it difficult to rebuild their houses or livelihoods.

When poorer communities suffer disproportionately due to a depletion of their assets, the income **inequality** within the disaster-affected area widens further. While it happens at the household and community levels, the inequality could also increase at the regional levels. The eastern regions of India which suffer disasters on a frequent basis have a lower per capita income compared to other regions where the impact of disasters is not so severe.

Climate change impacts in India have led to significant warming in recent decades. Mean temperature has increased by 0.2° per decade for the period 1971-2007. Due to warming, the extreme rainfall events have increased.[9] Intra-seasonal distribution of rainfall too has changed considerably, causing huge impacts. Monsoon rains arrive late, and hence the rainfall in the month of June has reduced. In July, the average rainfall has increased, followed by a reduction in the month of August. In September, when the monsoon recedes, the rainfall has increased considerably. An increased variability in the distribution of rainfall across the rainy season has caused floods and droughts in many states with a regular frequency and introduced serious uncertainties in crop cycle.

India's cities are growing very fast. Over the last decade, **urbanization** in India has increased by almost 4 percent. About 35 percent of India's population lives in the cities. As the cities grow, they also lead to the expansion of paved, impermeable areas, which prevent rain from being absorbed by the soil thereby increasing flood hazard, particularly in low-lying areas. The most vulnerable groups, typically living in poverty, tend to settle and build homes in low-lying areas. The urban poor are particularly vulnerable to floods due to their location within cities.[10]

The growth of cities has not been supported through development of adequate housing and infrastructure. A lack of infrastructure, unsafe housing, and poor public health services can make the cities disaster-prone. For example, poor solid waste management can cause blockage to storm water and sewage networks that can lead to water logging and flooding. Encroachments on water bodies within the city lead to water shortages. Lack of access to safe housing with good provision for water, sanitation, health care and education affects the capacity of urban residents to recover.

Degradation of natural environment has increased disaster risks across the country. Such degradation includes pollution of environmental resources e.g. water, land and air or the reduction of forests cover, wetlands and water bodies, mangrove destruction, and lack of water flow in the

---

[8] Hallegatte, Stephane, Adrien Vogt-Schilb, Mook Bangalore, and Julie Rozenberg. 2017. Unbreakable: Building the Resilience of the Poor in the Face of Natural Disasters, p. 71.

[9] National Disaster Management Plan, 2019

[10] https://www.preventionweb.net/risk/poorly-planned-managed-urban-development

rivers. Disappearing mangroves can increase the impact of cyclones and storm surges, as denuded hillsides can increase water run-off and result in landslides.

A loss of forests cover in the catchment area leads to greater siltation in the rivers, which causes river beds to rise and reduces their carrying capacities. It rapidly increases the level of flooding and inundation, as was seen when the heavy rains in 2013 triggered devastating floods and landslides in the state of Uttarakhand. In 2014, when floods inundated Kashmir, encroachments were blamed for diminishing the holding capacity of lakes and other water bodies, aggravating the impact of the heavy rains.

Indiscriminate construction on the riverbanks prevents flood waters to spread. It increases water level and aggravates the flooding. While heavy rains in Kerala caused the flooding in 2018, construction of houses and flats on the riverbanks did contribute to the scale of floods.

While India has made rapid strides in economic development and poverty alleviation, the course of development has generated new risks. Unregulated construction and unplanned settlement in cities and towns have increased the vulnerability of these settlements to different types of risks. Urban flooding has become a regular feature of the Indian cities. Similarly, non-enforcement of building codes have also made the houses prone to earthquakes and unsafe. Developments in coastal zones and floodplains have increased the risk of prolonged flooding and inundation. Overdrawing ground water has depleted the ground water level to such an extent that recharging ground water would be very difficult.

1.4 Need for Mitigation Measures

If there are external drivers of risks, which arise through many development activities, they need to be addressed through appropriate interventions. Known as mitigation measures, they are an important part of disaster management cycle. While development must continue such as construction of infrastructure and houses, the risks arising from these activities could be reduced considerably through hazard-resistant construction technology.

The term **'mitigation'** refers to reducing the adverse impact of a physical or man-made hazard. Hazard events cannot always be prevented fully. However, their impact could be reduced substantially by various strategies and measures, which are known as mitigation measures. These measures differ for different hazards. The scale of these measures would also be different for different communities and areas. These measures could be structural (construction of a protection structure, retrofitting of buildings, etc.) and non-structural (building by-laws, codes, land use plan, etc.). In most of the situations, mitigation is not a single solution measure, but it includes a combination of structural and non-structural solutions.

1.5 Disaster Management Act, 2005.

The Disaster Management Act, 2005 defines mitigation as 'measures aimed at reducing the risk, impact or effects of a disaster or threatening disaster situation'.

The Disaster Management Act, 2005 recognizes the importance of mitigation through introducing relevant provisions in the Act. If these provisions are implemented, mitigation would be established as an integral component of disaster management.

The DM Act includes mitigation as one of the key functions of Disaster Management Authorities at the national, state and district levels. In addition, these Authorities need to review development plan and ensure the integration of mitigation in these plans. As per the Act, the Disaster Management Authorities may also recommend provision of funds for mitigation.

The DM Act suggests that the National, State and District Disaster Management Plans should include mitigation measures to reduce the effects of disasters. These Plans also seek to integrate mitigation measures in development plans.

The DM Act stipulates that all the ministries and departments of the Central and State governments as well as district-level agencies include mitigation in their development plans and activities and allocate funds for these measures.

Section 47 and 48 of the DM Act lays down the provision for the constitution of National, State and District Disaster Mitigation Funds. These provisions have been included to allocate resources for the implementation of mitigation measures.

The mitigation fund guidelines are issued under section 47 and 62 of the DM Act, 2005 and shall be called 'National Disaster Mitigation Fund' (NDMF) and 'State Disaster Mitigation Fund' (SDMF) guidelines and will be operative from the financial year 2021-22 to 202-26, and will continue till further orders.

1.6 National Policy on Disaster Management

The National Policy on Disaster Management underscores the importance of mitigation in disaster management functions. It states: "with mitigation measures along with proper planning of developmental work in the risk prone area, these hazards can be prevented from turning into disasters. A multi-pronged approach needs to be adopted to undertake mitigation measures:

- Building mitigation measures into all development projects.
- Initiating of National level mitigation projects by the NDMA, in high priority areas, with the help of the Central Ministries and Departments concerned and the States.
- Encouraging and assisting State level mitigation projects in accordance with the guidelines.
- Indigenous knowledge on disaster and coping mechanisms adopted by various States will be given due weightage with special focus on protection of heritage structures."[11]

1.7 National Disaster Management Plan and Guidelines

The National Disaster Management Plan (NDMP) refers to mitigation as a composite of structural and non-structural measures. Structural measures include physical facilities and infrastructure

---

[11] National Policy on Disaster Management, 2009, p. 17 https://ndma.gov.in/images/guidelines/national-dm-policy2009.pdf.

which reduce disaster risks, while non-structural measures refer to laws, regulations, and risk transfer mechanisms, which enforce disaster-resilient planning. The National Plan suggests development of techno-legal regime that facilitates mainstreaming disaster risk reduction into development activities. The National Plan further advocates mainstreaming disaster risk reduction into poverty and socio-economic development efforts through identifying several areas.

In addition to the National Plan, the NDMA has issued 30 Guidelines on different types of hazards, which include natural and man-made hazards. These guidelines include many recommendations on hazard-specific mitigation measures, which need to be implemented by the States. The implementation of these measures at the grassroots level would require commitment of financial and technical resources.

1.8 Sendai Framework for Disaster Risk Reduction

The Sendai Framework for Disaster Risk Reduction (2015–2030) is a global framework, to which India has signed and undertaken to implement. The Sendai Framework has four specific priorities for action:

a. Understanding disaster risk;
b. Strengthening disaster risk governance to manage disaster risk;
c. Investing in disaster risk reduction for resilience; and
d. Enhancing disaster preparedness for effective response, and to "Build Back Better" in recovery, rehabilitation and reconstruction.

The priority "investing in disaster risk reduction for resilience" is directly related to mitigation. As India would implement the Sendai framework, it is important to develop interventions around this priority and implement it at the national, state and district levels. India's achievement of targets set under the Sendai framework would thus depend upon investment in mitigation measures.

1.9 15th Finance Commission Recommendations

The 15th Finance Commission, which is tasked with allocating resources for disaster risk management at the Central and State levels, through its interim report for the year 2020-21 has made the following recommendations:

(i) Mitigation funds shall be set up at both national and state levels in the form of a NDMF and State Disaster Mitigation Funds (SDMF), in accordance with the Disaster Management Act.

(ii) These mitigation funds shall be used for those local level and community-based interventions which reduce the risks and promote environment-friendly settlements and livelihood practices. However, large-scale mitigation interventions such as construction of coastal walls, flood embankments, support for drought resilience etc. should be pursued through regular development schemes and not from the mitigation fund.

The 15th Finance Commission has also recommended that the detailed guidelines for the constitution and utilization of these funds shall be issued by the Ministry of Home Affairs, in consultation with National Disaster Management Authority (NDMA). These funds should be supervised by the NDMA at the national level and State Disaster Management Authorities (SDMAs) at the state level as per the Act.

As per the recommendation of the 15th Finance Commission, the Ministry of Home Affairs has issued operational guidelines for the NDMF and SDMF. The operational guidelines lay down the procedure for approval and disbursement of funds. The guidelines enunciated here apply to both the NDMF and SDMF.

1.10 Establishment of the Mitigation Fund at National and State Level

As enunciated in the legislation, policy and frameworks as discussed above, the Mitigation Funds are set up at the national and state levels. As per the recommendations of the 15th Finance Commission, the NDMF and SDMFs consist of 20 percent of the National Disaster Risk Management Fund (NDRMF), and State Disaster Risk Management Fund (SDRMF), respectively. The Finance Commission has allocated resources for both the National Disaster Mitigation Fund and State Disaster Mitigation Funds.

1.11 Purpose and Scope of Mitigation Guidelines

The objective of these guidelines is to support the National, State, and District Disaster Management Authorities to utilize the resources available with Mitigation Funds as per Section 47 and 48 of the Disaster Management Act, 2005. Drawing upon various guidelines and frameworks prepared by the NDMA, the Mitigation Guidelines sets out key principles and policies of mitigation programmes and presents a hazard-wise list of mitigation measures. These mitigation measures reduce damage to the assets, livelihoods, and natural resources thus creating a resilient community.

The guidelines for Mitigation aim to set up a national mitigation system. All the mitigation projects developed and implemented would be part of the national mitigation system.

The guidelines for Mitigation help the SDMAs and implementing agencies including their experts and practitioners in developing mitigation projects and applying for funds. The guidelines explain the concept of mitigation, types of mitigation measures, and implementation modalities. The guidelines propose monitoring and evaluation arrangements and accountability measures.

The Mitigation Fund Guidelines of NDMF and SDMF are applicable to:

- All disasters recognized under the norms / guidelines of the National Disaster Response Fund (NDRF) State Disaster Response Fund (SDRF) and the state specific local disasters notified by the State Governments.

- The Mitigation Fund shall be used for those local level and community-based interventions, which reduce the risks and promote environment-friendly settlements and livelihood practices. Large scale mitigation interventions such as construction of coastal walls, flood embankments, support for drought resilience etc. shall be pursued through the regular development schemes and not from the mitigation fund.

- Any potential natural or human-induced hazard or disastrous events deemed to be incorporated for mitigation by National and / or State Disaster Management Authority.

As the Disaster Management Authorities acquire more experience in mitigation, the guidelines will be updated. Along with the Mitigation Guidelines, the guidelines on other funding windows, (a) Response; (b) Recovery and Reconstruction; and (c) Preparedness and Capacity-building are prepared. Due care has been taken to ensure that these Guidelines are complementary to each other, and do not create any significant overlap.

The guidelines are organized into four chapters. The first two chapters deal with the conceptual and policy aspects of mitigation. The remaining chapters deal with details of the Mitigation Funds and project formulation. In the Annexure, a list of hazard-wise mitigation measures is presented. In addition, the Annexure includes the format for application for Mitigation projects.

The Guidelines for Mitigation Funds (NDMF / SDMF) are operational from the date of its issue by the National Disaster Management Authority (NDMA) with the concurrence of MHA and will be remain in operation till further notification. Further, hazard specific mitigation guidelines will be issued by NDMA from time to time in consultation with MHA.

Chapter 2
Chapter 3 Disaster Mitigation: Conceptual Framework

2.1 Overview

Disaster Management in India is geared towards bringing a paradigm shift. The relief centric approach of the past is effectively being replaced by a more proactive, holistic and integrated approach for Disaster Risk Reduction.[12] The traditional view of disaster management considered disasters as a temporary disruption in the development process. Such an approach demands significant investment into humanitarian relief work followed by recovery and rehabilitation of the affected communities. On the other hand, the contemporary approach of Disaster Management utilizes a systematic methodology to identify, assess and reduce all kinds of risks associated with hazards and human activities.

With rapid development, the nature of risk is also evolving. It has, therefore, become critical that we adopt appropriate strategies to reduce these risks and create safer living conditions for people. Such strategies may require a broader enquiry into the history and nature of disasters, risks associated with diverse social groups and local understanding.

The development of disaster mitigation strategies demands a thorough understanding of concepts such as hazards, risks, vulnerabilities and capabilities of communities involved is required. It also requires an understanding of disaster mitigation as part of development processes, disaster management cycle and its relationship with other phases like preparedness or recovery. This chapter besides providing details of these concepts may also emphasize the commonalities and differences between disaster mitigation, climate change mitigation and adaptation.

---

[12] National Disaster Management Plan, 2019. A publication of the National Disaster Management Authority, Government of India. November 2019, New Delhi.

2.2 Disaster Management Cycle

The Disaster Management Cycle comprises of four elements – Mitigation, Prevention, Response and Recovery. One half of the cycle is constituted by mitigation and preparedness which generally occur before a disaster while response and recovery complete the other half of the sequence (Figure 1) and by definition are only possible in the aftermath of a disastrous event.

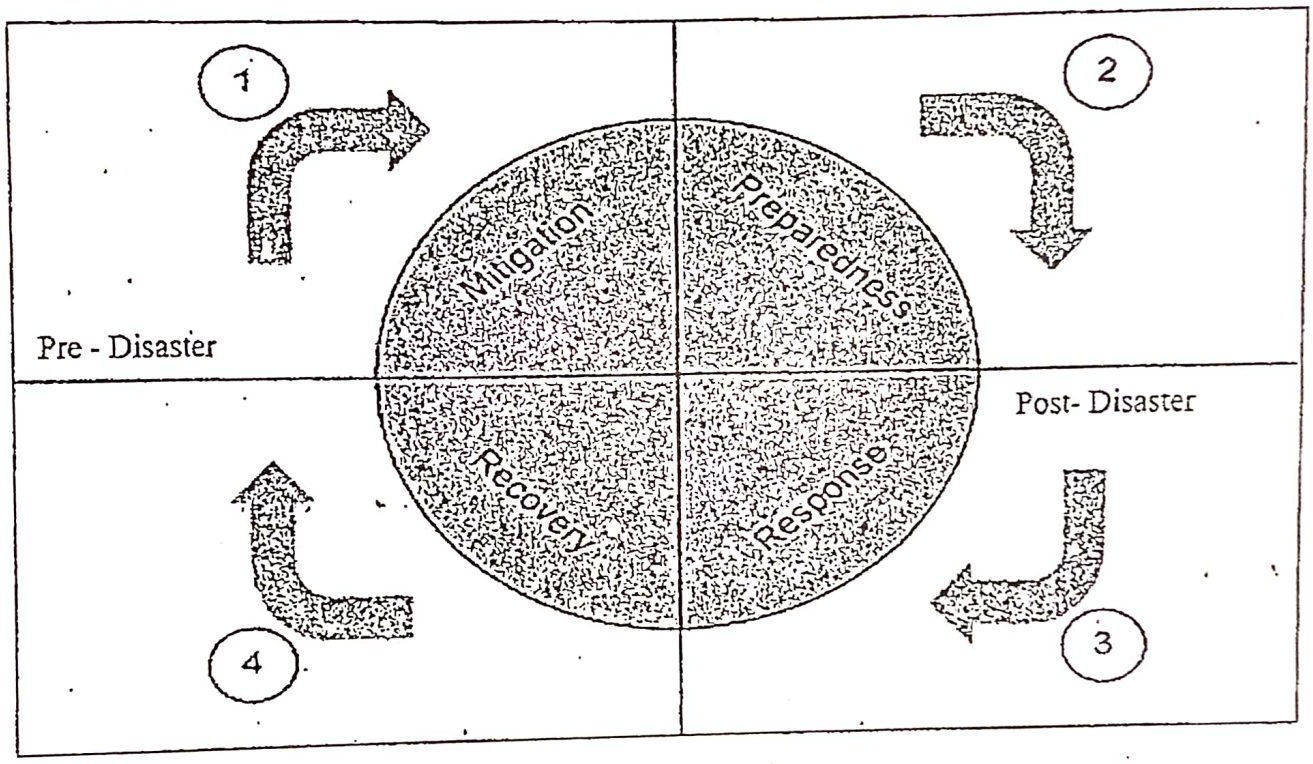


Figure 1. Disaster Management Cycle

The Disaster Management Act, 2005 defines mitigation as "measures aimed at reducing the risk, impact or effects of a disaster or threatening disaster situation". Mitigation measures can be both structural and non-structural (such as flood defences and shelterbelt plantations). Preparedness, on the other hand, can be defined as a state of readiness to respond to a disaster. Training and public education are the most common preparedness

activities which are very effective at ensuring that people know what to do before and during the disaster.[13]

2.3 Principal Hazards in India

India is vulnerable to different types of hazards, principle natural hazards are earthquake, flood, drought and cyclone; apart from these country experiences other disasters from other hazards such as tsunami, landslides, glacial lake outburst floods (GLOFs), urban flood, forest fires, soil erosion, lightning, hailstorms, heat waves, cold waves etc. It is critically important for both the public and the private sector to be aware of the kinds of threats that are most common in their geographic region and accordingly, prepare before the occurrence of such hazards. With such awareness of hazards, members of different communities get a chance to be fully educated and engaged as to how they might be affected by such events. This section highlights the predominant hazards that threaten our country. It may be noted that this is not an exhaustive list, as hazards like lightning and thunderstorm do lead to loss of lives and injuries every year and there is a substantive scope for structural and non-structural mitigation projects to address the challenge.

2.3.1 Earthquake

In India, approximately 58.6% of the country's land is prone to earthquakes of moderate to very high intensity. As per IS code 1893:2016, India has been divided into four seismic zones based on the past seismicity and location of fault lines, with Zone V being the most seismically active and zone II being the least. Whole North-east India, Northern Bihar, Uttarakhand, Himachal Pradesh, Jammu & Kashmir, Gujarat and Andaman & Nicobar are the most seismically active regions. Since late 1800s to till date, India has a recorded history of damaging earthquake which caused widespread damage, resulting in the loss of lives and property such as 1897 Shillong Earthquake (M 8.7), 1905 Kangra Earthquake (M 8.6), 1934 Bihar–Nepal Earthquake (M 8.4) and 1950 Assam–Tibet Earthquake (M 8.6), 1988 Bihar-Nepal Earthquake (M 6.6), 1993 Latur Earthquake (M 6.4), 1991 Uttarkashi (M 6.4), 2001 Bhuj Earthquake (M 7.9), 2004 Indian Ocean Earthquake (M 9.3), 2011 Sikkim Earthquake (M 6.9). and 2015 Nepal Earthquake (M 7.8). These damaging earthquakes have exposed the high vulnerability of the built environment and hence necessitated

[13]A. Bullock, George D. Haddow, and Damon P. Coppola, "Mitigation, Prevention, and Preparedness," *Introduction to Homeland Security*, 2013, 435–94, https://doi.org/10.1016/B978-0-12-415802-3.00010-5.

the creation of earthquake-resistant environment through increased awareness, capacity building, prevention, and mitigation measures.

2.3.2 Floods

Floods are one of the most common, recurring hazard events in India. Almost every year, some part of the country or the other is affected by the floods of varying magnitude.[14] Two major floods that occurred in India in the recent past are the Floods of 2013 which affected Uttarakhand, Himachal Pradesh, Uttar Pradesh, Bihar, Karnataka, Kerala, Gujarat, West Bengal provinces and the 2019 floods that affected Bihar, Assam, Maharashtra, Kerala, Rajasthan, West Bengal, Karnataka, Uttarakhand, Himachal Pradesh, Punjab, Uttar Pradesh, Tamil Nadu and Odisha.

2.3.3 Drought

India has a history of being affected by several, intensive droughts. Caused by the prolonged scarcity of water in a region, drought can range from a few days to years. Low precipitation, retreating glaciers, excessive groundwater consumption is a major reason that can lead to droughts. The effects of droughts are water scarcity, crop failure, migration, malnutrition and deaths.

In India, 74.6 million hectares of land comprising of 971 blocks of 183 districts, is affected by droughts. The droughts in 2002 had severe ramifications on states including Uttar Pradesh, Madhya Pradesh, Rajasthan, Punjab, Haryana, Delhi, Karnataka, Kerala, Nagaland, Orissa, Chhattisgarh, Himachal Pradesh, Gujarat, Maharashtra, Andhra Pradesh and Tamil Nadu. Similarly in 2015, the drought-affected Tamil Nadu, Rajasthan, Jharkhand, Assam, Andhra Pradesh, Himachal Pradesh, Nagaland, Maharashtra, Bihar, Madhya Pradesh, Chhattisgarh, Telangana, Jharkhand and Odisha. The drought of 2018 severely affected Karnataka and Maharashtra.

---

[14]Ministries of Government of India. "DRAFT NATIONAL DISASTER MANAGEMENT PLAN Part – II, Disaster Mitigation, Response and Function Plans." Ministry of Home Affairs, Government of India, Pg. 33

2.3.4 Cyclone

India with a coastline of 7517 kilometres, is highly vulnerable to cyclones. On the east coast, four States namely Tamil Nadu, Andhra Pradesh, Odisha and West Bengal and one UT, Puducherry and Gujarat on the west coast are more vulnerable than all the other coastal states and UTs. On an average, 5-6 cyclones hit the Bay of Bengal and the Arabian Sea each year, out of which 2-3 are severe. Two cyclones 'Amphan' and 'Nisarga' affected the east coast and west coast in 2020. A major cyclone 'Ockhi' occurred in 2017 ravaged the states of Kerala, Andhra Pradesh, Tamil Nadu and Lakshadweep Islands. In 2013, Cyclone 'Phailin' had hit Orissa, Andhra Pradesh, Jharkhand, Bihar, West Bengal, Chhattisgarh provinces. Similarly, in 2014, Cyclone 'Hudhud' had hit Andhra Pradesh, Orissa and Chhattisgarh.[15]

2.3.5 Tsunami

Tsunami is generated by an underwater disturbances usually associated with earthquakes occurring below or near the ocean. Volcanic eruptions, submarine landslides, and coastal rock falls can also generate a tsunami. Out of the 7516 km long coastline close to 5,700 km is prone to cyclone as well as tsunamis. The tsunami that occurred during 2004 Sumatra-Andaman earthquake of Mw 9.3 in the Indian Ocean had worst affected the country, Kerala, Tamil Nadu, Andhra Pradesh, Pondicherry and Odisha states were severely affected. This event generated the need of practical and effective ways for awareness generation, capacity building, education, training and research & development for better tsunami risk management in India.

2.3.6 Landslides

In India, at least 12.6% of the land area is affected by landslides. Majorly the landslides in India occur during monsoons or due to earthquakes. Construction of roads in the mountains also causes frequent landslides in India. In 2014, the village of Malin in Pune (Maharashtra) suffered a massive landslide that impacted the entire village and surrounding areas. Similarly, the states / UTs of Himachal Pradesh, Uttarakhand, Jammu-Kashmir and other north-eastern states of Sikkim, Assam, Meghalaya, Manipur, Mizoram, Nagaland were also severely affected by landslides. In recent year, incidences of Landslide Lake Outburst Flood (LLOF) are increasing due to breach of landslide dammed river in hilly regions and causing threat to downstream settlements and infrastructure.

---

[15] Université catholique de Louvain (UCL), "EM-DAT: The Emergency Events Database."

2.3.7 Glacial Lake Outburst Floods (GLOFs)

Glacial retreat due to climate change occurring in most parts of the Hindu Kush Himalaya has given rise to the formation of numerous new glacial lakes, which are the major cause of Glacial Lake Outburst Floods (GLOFs). A GLOF is a type of flood occurring when water dammed by a glacier or a moraine is released suddenly. Since glaciers in the Himalayas are in a retreating phase, glacial lakes are growing and pose a potentially large risk to downstream infrastructure and life. As glaciers retreat, the formation of glacial lakes takes place behind moraine or ice dam. The possibility of GLOF in Indian Himalayan Region (IHR) is escalating very rapidly, which poses a threat to the lives of millions of people living in this region. Recent example of GLOF happened in Rumbak in Leh District of Ladakh on 24th August 2021.

2.3.8 Urban Floods

In urban environments, farmland, vegetation and bare soil have been converted into built-up areas due to rapid development[16]. As a result, precipitation brought by seasonal weather, cyclones etc. produce excessive runoff water in developed areas where the water doesn't have anywhere to flow. This is known as urban flooding.

Urban flooding is a major problem in many parts of the world and is a common event which takes place every year. As it is a natural hazard, avoiding it is not possible; however, the damage that occurs due to this type of flooding can be prevented by proper flood mitigation strategy. There has been a constant rise in the urban floods across cities in India including Chennai (2004, 2010, 2015), Srinagar (2014), Jamshedpur (2008), Kolkata (2007), Bangalore (2005, 2017), Surat (2006), Mumbai (2005, 2017), Delhi (2002, 2003), and Ahmedabad (2001).

2.3.9 Forest Fire

India is one of the richest areas of biodiversity in the world having nearly seven lakh square kilometers of forest cover. Increasing human interference is a major cause for the incidents of the forest fires. Forest fire causes loss of homes, property and critical infrastructure, damage to domestic watersheds and destruction of commercially valuable timber. Smoke from forest fires can also interfere with road and air transportation, inhibit tourism, and cause serious public health problems. It is also a threat to human settlements dwelling within or adjacent to the forests.

Forest fires in India are generally ground fires. As per Forest Survey of India (FSI), human activities trigger nearly 95 per cent of the forest fires in India. Forest fire is a major cause of

---

[16]Eldho, T.I., P.E. Zope, and A.T. Kulkarni. "Urban Flood Management in Coastal Regions Using Numerical Simulation and Geographic Information System." In *Integrating Disaster Science and Management*, 205–19. Elsevier, 2018. https://doi.org/10.1016/B978-0-12-812056-9.00012-9.

injury and loss to forests. It has wide-ranging adverse ecological, economic and social implications.

2.3.10 Soil Erosion

In the last 150 years, half of the topsoil on the planet has been lost. The effects of soil erosion go beyond the loss of fertile land. It has led to increased pollution and sedimentation in streams and rivers, clogging these waterways and causing declines in fish and other species. Degraded lands are also often less able to hold onto water, which can worsen flooding. Sustainable land use can help to reduce the impacts of agriculture and livestock, preventing soil degradation and erosion and the loss of valuable land to desertification.

2.3.11 Lightning

Ligtning is a high-current electric discharge results from the buildup of positive and negative charges in a thunderstorms that occurs in the earth's atmosphere and that has total path length of the order of few kilometers. The peak power and total energy in lightning are very high, the peak power that is dissipated by a lightning discharge is on the order of 100 million watts per meter of channel and the peak channel temperature approach 30,000 °C. Every year due to lightning loss of human life occurred in the regions of Jharkhand, Bihar, Uttar Pradesh etc.

2.3.12 Hailstorm

Hailstorm is a climate hazard which cause serious damage to crops and property. In India, hailstorms mostly affect the northeast and western Himalayas, with the maximum strikes in March and April.

India being mainly an agriculture oriented economy whose growth purely depends on the vagaries of the weather particularly the extreme weather events like hailstorms. Maharashtra is most prone with a 91% to 95% probability of hailstorms striking the state, Himachal Pradesh, Punjab, Assam and Madhya Pradesh come next with 66-70% probability followed by Andhra Pradesh, Telangana, Uttar Pradesh and Haryana at 61-65% probability and the least occurrence (6%-10%) is recorded in Gujarat, Chhattisgarh, Tamil Nadu, Tripura, Meghalaya, Sikkim and Nagaland. In February 2018, around 300,000 hectares of crops like jowar, gram, wheat and horticulture crops like orange, grapes, bananas, and vegetables were damaged. Similarly, around 100,000 hectares of crops like wheat, gram, peas, lentils, rapeseed and mustard were damaged in Uttar Pradesh. Monitoring of such events may be of immense use for impact assessment studies and adaptations under anticipated climatic variability scenarios. These studies may help to undertake measures by different agencies for sustainable development particularly in agrarian based economies like India.

2.3.13 Heat Wave

In, India heat waves can be observed during the summer season from March to the onset of monsoons in July. The intensity and frequency of heat waves have been increasing in India with each passing year and this has been related to the phenomenon of climate change[17]. Along with physical problems of heatstroke, cramps and exhaustion, they also cause stress in the regions they impact. Andhra Pradesh was affected by a heat wave in 2002 during which several people died. In 2019, the temperature in Rajasthan went up to 50 degrees Celsius[18] resulting in a heat wave that was estimated to have lasted over a month.

2.3.14 Cold Wave

Apart from southern India, the whole nation northern mountains and plains are affected by the cold wave, especially the Himalayan states. The biggest challenge of cold waves is crop failure which affects many people.

2.4 Importance of Disaster Mitigation

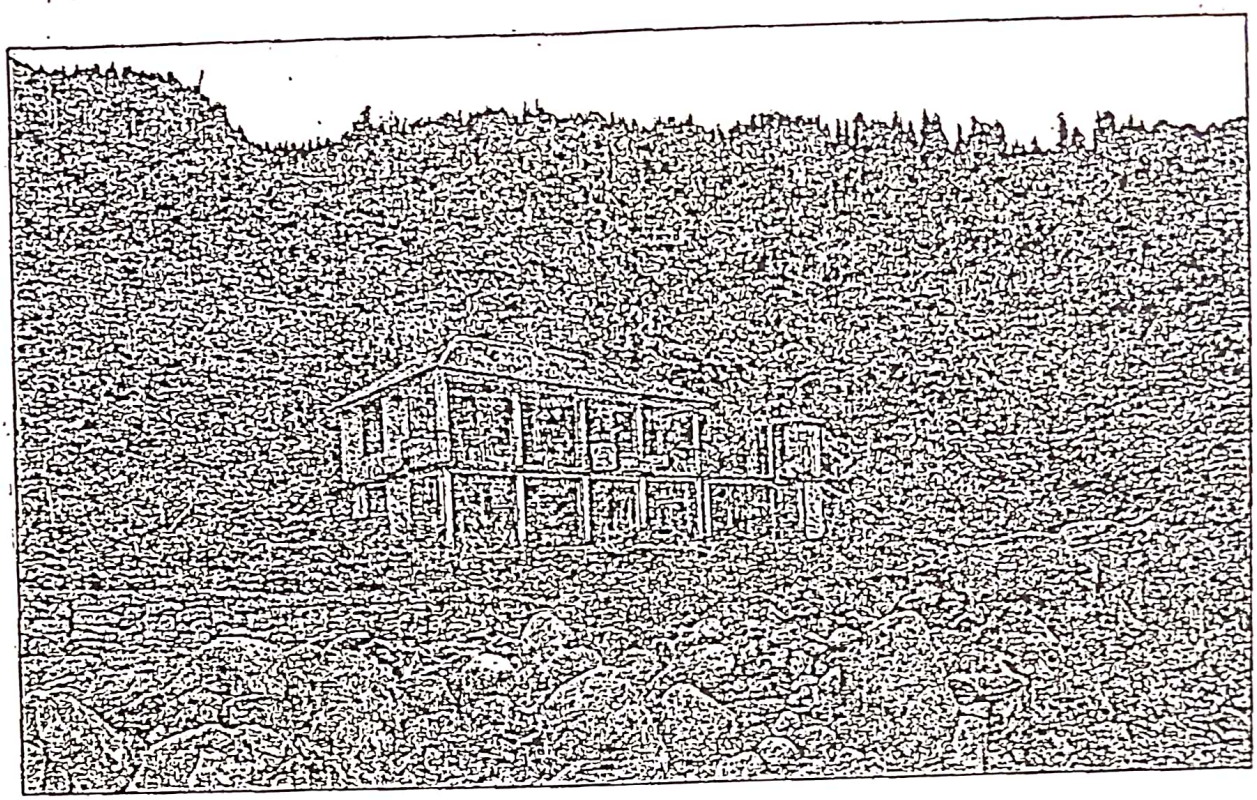
Disaster Mitigation is vital for sustainable disaster risk management. This is because the strategies that are targeted strictly towards post-disaster response tend to be costlier than those accounting for pre-disaster opportunities.

Several assessments have shown that impact of disasters is high because of accumulated risks (e.g. marginalized communities living close to riverbanks, decaying infrastructure of schools etc.) that persist within the current development paradigm or are systematically ignored because of limitations of funds, policies etc. The significance of disaster mitigation arises from the fact that any effort in pre-empting the occurrence of disasters, reducing exposure to the hazard and reducing the vulnerabilities through a systematic process may significantly reduce the demand for resources towards disaster response or recovery.

---

[17]Heat Wave - National Disaster Management Authority," https://ndma.gov.in/en/2013-05-03-08-06-02/disaster/natural-disaster/heat-wave.html.

[18]"India Reels as Summer Temperatures Touch 50C," *BBC News*, June 3, 2019, sec. India, https://www.bbc.com/news/world-asia-india-48495492.



Picture 1: School building located in the hazard-prone area.

2.5 Disaster Mitigation and Development

It is important to consider exposure to hazards and the consequences of disasters while planning development policies. The government bodies accountable for setting development priorities and planning should be fully aware of the impact of natural and human-made hazards on societies and economies.[19] However, to assume that mitigation strategies are always incorporated into development programs may not always be correct.

Mitigation, on the other hand, is a strong disaster risk management strategy that takes into account the external shocks against which the people and their livelihoods are required to be protected. These strategies have a special focus on the lives and livelihoods of the poor, who, due to rapid urbanization, have become more vulnerable (UNDP, 2004).[20] Therefore, the mitigation

---

[19]http://www.nzdl.org/gsdlmod?e=d-00000-00---off-0aedl--00-0----0-10-0---0---0direct-10---4-----0-0l--11-en-50---20-about---00-0-1-00-0--4----0-0-11-10-0utfZz-8-10&cl=CL1.3&d=HASH68c99b49db2847ff4206b4.7.3.2&gt=1.

[20]Lisa Schipper and Mark Pelling, "Disaster Risk, Climate Change and International Development: Scope for, and Challenges to, Integration," *Disasters* 30, no. 1 (2006): Pg 25.

projects proposed activities should have long-term DRR impact in the region and take into account the impact on the most vulnerable sections of society.

2.6 Disaster Mitigation and Climate Change Mitigation

Global agreements are consciously pushing for incorporating strong mitigation measures in disaster management and climate change frameworks. The term mitigation, however, adopts a different approach when seen through the lens of climate change and reflects differently when understood in the context of disaster risk management. The stakeholders and practitioners must understand the difference.

As per the Intergovernmental Panel for Climate Change (IPCC), climate change mitigation is defined as "a human measure to reduce the sources or enhance the sinks of greenhouse gases." It affects the frequency and severity of only weather-related hazards. The instances of climate change mitigation measures are reduction or curbing the emission of greenhouse gases. [21]

The objective of disaster mitigation measures, on the other hand, is to reduce the risks associated with all types of hazards – natural and human-induced. These measures may include seismic retrofitting, reforestation aimed at landslide risk reduction, to name a few examples.

2.7 Disaster Mitigation and Climate Change Adaptation

Climate change and disasters are closely interconnected. A degraded ecosystem (e.g. Deforestation) can increase the risk of a disaster (e.g. landslides) while the occurrence of a disaster can result in loss of lives and livelihoods. A disaster can also potentially damage the environment leading to high exposure and vulnerability of the people.[22]

It is expected that climate change and variability will continue to "drive disaster risk, with significant increases in the frequency, intensity, spatial extent and duration of extreme events."[23] Understanding the significant overlap between the problems that disaster mitigation and climate

---

[21] https://www.gfdrr.org/sites/gfdrr/files/publication/GFDRR_DRM_and_CCA_ECA.pdf pg 5

[22] Proact Network, "Climate Change Adaptation And Disaster Risk Reduction Policy Paper," 200

[23] Ibid

change adaptation seek to address, a clear mandate has been provided by the Sendai Framework and the Paris Agreement on climate change for better coherence in approaches to climate change adaptation and disaster mitigation.[24]

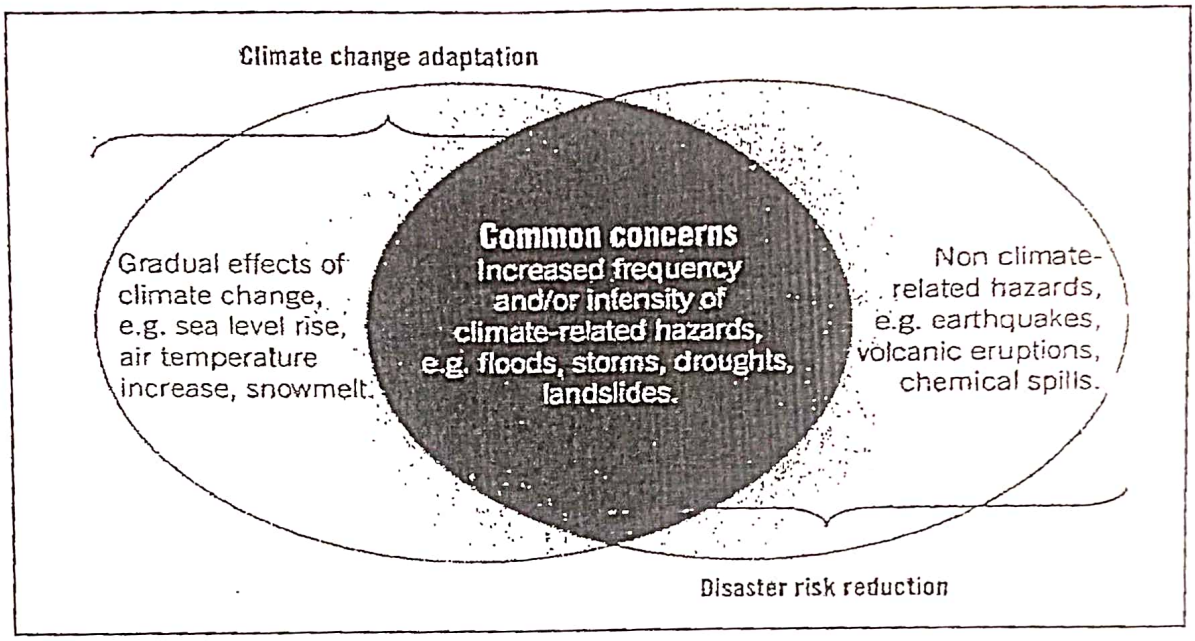


Figure 2. Relationship between Climate Change Adaptation and Disaster Risk Reduction[25]

In India, climate change and variability have increased the frequency and severity of hydro-meteorological hazards. The impact of these hydro-meteorological hazards could be moderated through climate change adaptation. These adaptation measures may include water conservation, plantations, diversified livelihoods, alternative cropping, and low carbon housing. The XV-FC

[24]"Common Ground Between the Paris Agreement and the Sendai Framework : Climate Change Adaptation and Disaster Risk Reduction | OECD ILibrary," https://www.oecd-ilibrary.org/sites/3edc8d09-en/index.html?itemId=/content/publication/3edc8d09-en.

[25]Marilise Turnbull, Charlotte Sterrett, and Amy Hilleboe, *Toward Resilience: A Guide to Disaster Risk Reduction and Climate Change Adaptation* (Practical Action Publishing, 2013).

Towards resilience; A Guide to Disaster Risk Reduction and Climate Change Adaptation, Turnbull et.al ,2013

acknowledges the shared common ground between climate change adaptation and disaster mitigation.

2.8 Disaster Mitigation Measures

Disaster Risk Reduction planning comprises of all the actions taken to eliminate or reduce the risk to life and property that includes both the existing structures and future construction, in the pre and post-disaster scenario. This is achieved through regulations, land use, building practices and mitigation projects that reduce or eliminate long-term risk from hazards and their effects. There can be hundreds of mitigation measures which can range from structural to non-structural measures. It may be noted that for all practical purposes, the phrase 'disaster mitigation' is the same as 'disaster risk reduction'. Disaster mitigation builds capacity, in both its structural and non-structural forms. Mitigation measures can be structural and non-structural as mentioned in NDMF / SDMF Guidelines issued by MHA and as per indicative list as given at annexure-I.

2.8.1 Structural Mitigation Measures

Structural mitigation includes the physical adaptation measures undertaken at both institutional and individual level to resist the impacts of disasters. UNDRR defines Structural Mitigation measures as any physical construction to reduce or avoid possible impacts of hazards, or the application of engineering techniques or technology to achieve hazard resistance and resilience in structures or systems. Structural mitigation measures attempt to strengthen buildings to better endure future disasters like cyclones and earthquakes. There are two ways of accomplishing this: demolishing the existing the structure and rebuild to adapt new hazard information, or it may be amended so that it resists the expected external force (retrofitting).[26] Structural Mitigation Measures can be classified as:

a) **Structural and Infrastructure Projects:** These measures involve modifying existing structures and infrastructure to protect them from any structural damages. This can be applied to public and private structure, critical facilities, infrastructure and services. These measures can also involve projects to construct man-made structures to reduce and impact of hazard; however, since the project costs of creating new infrastructure are very high, this kind of projects are

[26]Bimal Kanti Paul, *Environmental Hazards and Disasters: Contexts, Perspectives and Management* (John Wiley & Sons, 2011).Pg 167

prohibited through mitigation fund and should be executed through regular development discourse.

2.8.2 Non-Structural Mitigation Measures

Non-structural measures do not involve physical construction but use knowledge, practice or agreement for DRR and impacts, in particular through policies and laws, public awareness-raising, training and education (UNDRR). It is important to have an amalgamation of traditional knowledge with the technical understanding of environmental processes. Non-structural measures can be categorised into the following measures:

a) **Local Planning and Regulations:** These measures help in localization of mitigation concepts in a specific region or for a particular community. Local Planning and regulations evolve from needs, aspiration and understanding of local communities towards a particular hazard. These strategies can also look at developing region/ location-specific codes, guidelines and projects. The 73rd and 74th amendment of Indian Constitution provides a strong foundation to implement these strategies.

b) **Building Codes and Laws:** Building codes are a collection of laws, regulations, ordinances, or other statutory requirements adopted by a governmental legislative authority regarding the physical structure and/or construction of buildings. These measures are designed in a way to ensure that structures resist the physical impacts of disasters. Its primary application is to regulate new or proposed construction. Such codes are not restricted only to structural design, but also apply to methods and materials used for construction.

c) **Insurance:** In India, most of the losses suffered in disasters are not insured, for reasons such as lack of knowledge about the availability of such covers, inability to buy the insurance and lack of interest. Although insurance has no control over the actual disaster consequences, it can provide financial protection to people, preventing negative economic hardship after a disaster. It allows for faster

rebuilding and recovery by providing funding and liquidity soon after the disaster.[27]

d) **Natural System Protection:** These measures focus on the adoption of systems that would preserve or restore the function of natural systems e.g. sedimentation and erosion control, forest management, restoration of mangrove, restoration of wetlands, lakes etc. Natural system protection can also be seen as active measures to converge mitigation measures with climate change adaptations.

e) **Education and Awareness Program:** These measures involve informing and educating citizen, elected officials, property owners and various other stakeholders about hazards and importance of mitigation. It is often seen that the efficacy of mitigation measures such as local planning, regulations and natural system protection cannot be achieved without education, awareness and active engagement of the stakeholder.

A good mitigation project is a combination of both structural and non-structural mitigation measures and it evolves with community participation and local actions. A unique set of mitigation strategies are possible for each hazard and disaster managers may choose the most effective strategy depending on its costs, availability of funds and the projected cost-benefits of promoting certain mitigation measures. A list of hazard-specific mitigation measures is included in **Annexure 1.**

2.9 Mitigation Programme & Projects: Key Steps and Stakeholders

The frequency and severity of disaster during the recent decades and their impacts on poverty, development and environment has brought a new focus on mitigation, which represents multiple protective approaches to reducing these impacts. As reflected in the Disaster Management Act, 2005 and Disaster Management Policy, 2009, mitigation is an important responsibility of the Disaster Management Authorities, which need to be pursued in coordination and partnership with

[27] "The Role of Natural Disaster Insurance in Recovery and Risk Reduction," *Risk Management and Decision Processes Center* (blog), May 7, 2019, https://riskcenter.wharton.upenn.edu/lab-notes/the-role-of-natural-disaster-insurance-in-recovery-and-risk-reduction/.

other development institutions. An important responsibility of the Disaster Management Authorities as conferred by the DM Act, 2005 is to "recommend provision of funds for the purpose of mitigation".

In the practice of disaster risk management, there is clear evidence of emphasis on a more integrated and holistic risk management as part of development planning. In recent years, financial and technical resources are being allocated to risk reduction activities from sources other than response funds. There are large-scale mitigation projects being implemented in the country for specific hazards such as cyclones, floods and earthquakes.

The Disaster Management Policy, 2009 recommends building mitigation measures into all development projects, which include initiating national level mitigation projects by the NDMA in high priority areas, with the help of the Central Ministries and Departments concerned and the States and encouraging and assisting State level mitigation projects in accordance with the guidelines.

If the mitigation represents an important area of disaster risk management, mitigation programmes / projects need to be formulated in a way that clearly demonstrates impact of risk reduction. Such a programme / projects formulation requires technical skills and proficiency which needs to be encouraged and developed.

It is also mentioned in the Guidelines of NDMF and SDMF that the Disaster Management Authorities may conduct the risk assessment, which presents an assessment of hazards, exposure and vulnerability and their likely impacts. Based on the risk assessment, the Disaster Management Authorities may prepare long-term mitigation strategy for their respective jurisdictions. Such a strategy / programmes / projects formulation requires a process which could vary from one project to another, but there are five essential steps that need to be followed in every programme:

2.9.1 Risk Assessment and Hazard Identification

Risk Assessment

Risk Assessment is to determine the nature and extent of risk by analyzing potential hazards and evaluating existing conditions of vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment on which they depend. As per ISDR, risk assessment is based on a review of both the technical features of hazards such as their location, intensity, frequency and probability; and also the analysis of the physical, social, economic

and environmental dimensions of vulnerability and exposure, while taking particular account of the coping capabilities pertinent to the risk scenarios.

Hazard Identification

Identifying the geographical area, assessing magnitude and severity of hazards, and estimating the impacts, past and future, are the first step in developing such a programme. Hazard information can be presented in several forms: people's experiences, events database, estimates of damage and loss, hazard maps, and other evidence related to physical attributes of hazards. It is important to recognize that hazards are central to mitigation programme, and the programme formulation must present a case for reducing the impact of hazards. The focus on hazards is what distinguishes a mitigation programme from a natural resource development or environmental conservation programme.

2.9.2 Vulnerability / Capacity Analysis

As we identify the hazard, it is equally important to determine who and what would be at risk if the hazard event occurs, and how such an event affects the society and economy. Disasters affect people in different ways, depending upon their socio-economic conditions. The differential impact of disasters need to be analyzed to identify the communities and households which are most affected. Other elements of such an analysis are the patterns of losses, how these losses determine the levels of poverty, and how communities face other aspects of deprivation. Communities and households are at the centre of vulnerability analysis. Along with vulnerability, capacities are also assessed, which extend to communities, local governments, and other social and government institutions. These capacities are essential for planning, implementation and maintenance of all the mitigation measures. Both vulnerabilities and capacities are assessed as part of just one exercise.

2.9.3 Planning Mitigation Measures

Once the context of hazard and vulnerability is established, mitigation measures need to be identified. These mitigation measures are essentially development interventions and pertain to planning, policy changes, structural interventions, natural resource and environmental improvements. One of the defining features of the mitigation programme is that mitigation

measures are multi-pronged and include several activities in combination. For example, to reduce the impact of floods, it is not sufficient that we just build embankments. Floods require efficient natural drainage, surface water storage, and elevated houses. All these measures need to be implemented following a river basin approach, where there should be restrictions on land use in the floodplains. The mitigation measures would thus include a combination of interventions aimed at physical protection, regulation, social insurance, and assistance to communities and households.

2.9.4 Conducting Cost-benefit Analysis

Mitigation activities need to be supported by a cost-benefit analysis. Investments in a mitigation programme need to bring discernible risk reduction at a reasonable cost. A mitigation programme must always present the cost-benefit analysis and demonstrate the appropriateness of investment in terms of cost. A feasible mitigation strategy is not about hazard proofing but exercising a responsible choice of adjustments based on a careful cost-benefit analysis and public preferences.

2.9.5 Participatory Implementation

Mitigation measures need to be implemented with the support and participation of communities. The key requirement of peoples' participation in many ways differentiates a mitigation programme from any other infrastructure development programme. As laws, codes and regulations are at the centre of mitigation, they need community compliance. If communities participate in the programme and support it, the culture of compliance is stronger and the impact of mitigation interventions is more sustainable.

A mitigation programme is implemented through several stakeholders working together. The importance of these stakeholders in planning and implementing mitigation programmes cannot be overemphasized. The most important stakeholders are discussed below:

a) **Disaster Management Authorities:** The NDMA, SDMAs and DDMAs may initiate the mitigation measures based on hazard identification and vulnerability / capacity analysis. These Disaster Management Authorities pursue mitigation as part of the broader disaster management cycle, and link the activity to preparedness, response, recovery and reconstruction. A balanced approach to mitigation along with other activities of disaster management improves reduces the impacts, improves risk management and augments professional capacities.

b) **Central and State-level Technical Agencies:** Several central and state-level technical agencies have a mandate for developing and implementing mitigation measures. These agencies specialize in certain hazards and have a pool of expert professionals. These agencies have developed database and other tools for hazard analysis and risk assessment. These agencies can develop innovative mitigation solutions for certain hazards and implement them in partnership with the local governments and communities. These agencies are likely to be among the most important stakeholders in the mitigation projects at the national and state levels.

c) **Local / Urban Governments:** The Disaster Management Authorities empower and capacitate the Panchayati Raj institutions and Municipalities to implement mitigation measures at the local level. Disaster management is an important function of local governments, which is not limited to just response and relief. It extends to identifying all those hazard zones where introducing mitigation measures may build hazard-resistant communities. The PRI institutions and Municipal governments work with the communities to identify mitigation measures and pool their own resources for implementation. Implementation through local governments improves the sustainability of these measures and develops capacities within these institutions to support mitigation.

d) **NGOs, Civil Society Organizations and Communities:** NGOs, CSOs and communities work with technical agencies, experts and government officials to identify mitigation solutions and implement them. The participation of these local actors is important from the point of harnessing traditional practices and local solutions for mitigation. Further, the local-level actors exercise the ownership of these mitigation measures and contribute to maintaining the structures and respecting the codes and regulations. It is the participation of local actors which enhances community consciousness of risks and contributes to building resilience at the community level.

Chapter 3
Developing Mitigation Projects

3.1 Mitigation Strategy

The Disaster Management Authorities at different levels can develop and implement mitigation proposals in the areas which are related to the Mitigation Strategy for the concerned jurisdiction.

a) At the national, state and district levels, the Disaster Management Authorities need to conduct a risk assessment, which presents an assessment of hazards, exposure and vulnerability and their likely impacts. Based on the risk assessment, the Disaster Management Authorities prepare the Mitigation Strategy for their respective jurisdiction.

b) The Mitigation Strategy would include a list of mitigation measures which are relevant to reducing risks in the jurisdiction. The mitigation measures should be implemented for the people who are at risk, and should directly benefit them in terms of improving their physical safety and living conditions.

c) Mitigation measures are planned to reduce the impact of specific hazards. It combines structural (protection structures) and non-structural approaches (regulations, standards and insurance), based on a cost-benefit analysis. These include a range of measures or adjustments to be introduced in a hazard context rather than a single solution approach.

d) Mitigation measures should promote resistance to hazards so that its impact on people and their livelihoods and economy could be reduced. Mitigation measures should not aim at hazard-proofing or planning for maximum hazard scenarios as it becomes very expensive and prohibitive in economic terms.

The Mitigation Strategy forms the basis for identifying and approving the Mitigation projects. The development of Mitigation Strategy and its implementation must be supported through adequate technical expertise and public consultations. The Mitigation Strategy needs to be formally approved by the NDMA/ States and placed in the public domain. It is the plan/framework that should underwrite the development of mitigation projects to be funded by

the Mitigation Fund. As the development of Mitigation Strategy may take some time, it will not be a prerequisite for taking up mitigation projects in 2020-21.

3.2 Guiding Principles

Guiding principles represent values and ideals that both the Disaster Management Authorities at all levels and partner entities/agencies uphold in formulating and implementing mitigation projects. Mitigation projects should bring ideas, innovations, technologies, and communities together, reducing risks, improving environment and ecology and building resilience. The key principles that the Disaster Management Authorities need to follow for mitigation projects are as follows:

- **Develop projects which benefit the communities directly:** The projects should have a measurable impact on the communities in reducing their risks and improving their safety and living conditions. The project outputs need to reduce risks, build resilience and increase knowledge and awareness. A strong community orientation must characterize projects and activities funded by the Mitigation Funds.
- **Introduce solutions which bring new technologies and innovations:** The projects should plan and implement solutions which are aimed at introducing and disseminating new technologies and innovations such as building houses which are resistant to hazards and constructing safe schools. These technologies would help communities more hazard-resilient.
- **Achieve a balanced combination of structural and non-structural measures:** Mitigation measures are both structural and non-structural. While structural interventions for demonstration purposes (such as embankments, sea walls, storm water drainages, etc.) are costly, non-structural interventions (codes, regulations, land use planning) are cheaper and bring long-term behavioral changes. An appropriate mitigation strategy introduces an optimal combination of structural and non-structural interventions.
- **Advocate nature-based solutions and promote linkages with climate change adaptation:** Mitigation measures must promote nature-based solutions such as plantations, conservation of mangroves and wetlands, improvement in natural drainage and groundwater recharge, etc. to support mitigation of different hazards. Most of these solutions are helpful for climate change adaptation as they conserve natural resources and

improve bio-diversity. These solutions have multiple advantages with respect to offering more sustainable barriers against hazards.

- **Promote cost-effective models of mitigation measures:** Mitigation measures should be cost-effective and sustainable. A cost-benefit analysis should always guide the design and implementation of mitigation interventions as they need to be replicated. Mitigation strategy should not promote expensive solutions unless they are necessary.
- **Promote community participation and social inclusion:** Mitigation projects should involve the communities in planning and implementation and promote social cohesion. Bringing people together to work on a mitigation programme develops a shared perception of risk and mitigation measures. People support each other in living safely and conserving environmental resources.
- **Encourage women's participation and leadership:** Mitigation projects must involve women, who can play an important role in developing local plans, improvising measures, and establishing community ownership of these measures. Women have considerable experience in many areas which include traditional irrigation system, soil conservation, intercropping, and plantations, which could be used in these interventions. Encouraging women to be leaders of these initiatives can improve the local ownership of these mitigation interventions.
- **Value Indigenous Traditional Knowledge:** Mitigation measures must value local knowledge and information upon traditional practices available with the communities. These traditional practices and skills have supported them in pursuing their livelihoods and conserving their natural resource base. Mitigation projects should provide an opportunity to use local knowledge and skills in protecting their settlements and livelihoods and improve the quality of life indicators.

3.3 Project Cycle

Mitigation projects are developed, implemented and evaluated following a project cycle, which has four stages. The cycle begins with the design of projects, moves to the next stage of appraisal and approval, is followed up with the implementation, and the final stage of impact evaluation. The project cycle needs to be maintained to develop a pipeline of the mitigation projects, require due diligence in their preparation, and achieve efficiency and transparency in the implementation

of the projects. A properly maintained project cycle may also lead to developing a database of the mitigation projects at all levels.

The Disaster Mitigation Fund may follow a project cycle that includes the following four-stages:

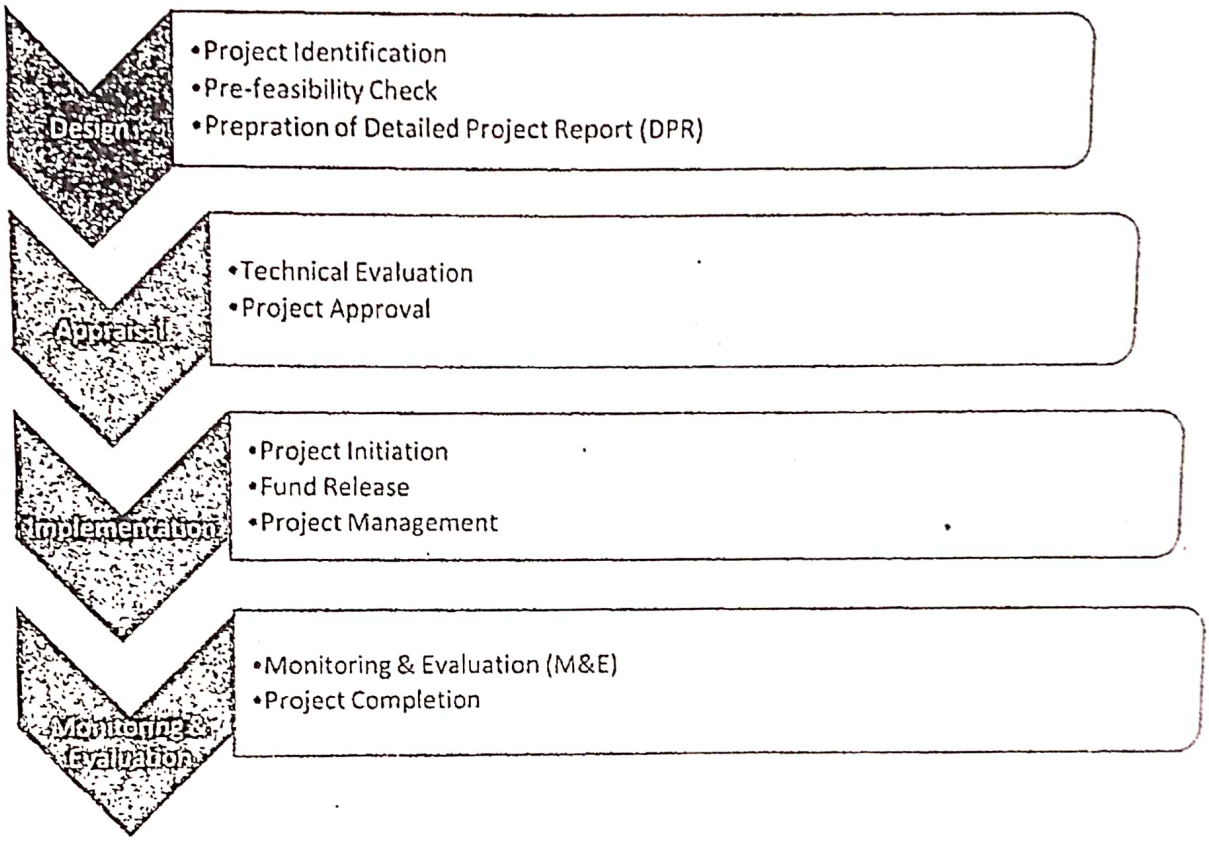


Figure 3: Disaster Mitigation Fund Project Cycle

3.3.1 Project Design

This phase of the project focuses on assessing if an intervention is required. Such an assessment would include pre-feasibility study based on concept papers / project proposals and identifying the type of interventions that need to be carried out. At this stage, the mitigation project goes through the following processes:

- Project Identification
- Pre-feasibility Check
- Preparation of a Detailed Project Report (DPR)

3.3.2 Project Appraisal

This stage of the project focuses on technical evaluation of the project proposal to ensure that the proposed activities and intended impacts are technically feasible, appropriate and cost-effective and socially inclusive. The Appraisal phase consists of a detailed technical evaluation of the project proposal and its approval.

3.3.3 Project Implementation

This stage extends from approval to progress of the project and includes all the measures to be adopted for the successful implementation of the project. The stage includes project initiation - development of a work plan, identification of the project team, project management arrangements - release and disbursement of funds, reporting etc.

3.3.4 Project Monitoring & Evaluation (M&E)

The Project Monitoring and Evaluation (M&E) upto project completion is integrated into the project cycle to ensure that the projects achieve the intended objectives. The projects need to have a systematic and objective assessment of the design, project progress monitoring, mid-term evaluation, final evaluation, completion of deliverables / outcomes, intended results, project closure, report etc.

3.4 Developing Mitigation Projects

There are two ways in which the mitigation projects are developed and implemented:

a) Several implementing partners from within the government and outside can submit their project proposals to the Mitigation Funds at different levels and request funding. The implementing partners need to present proposals related to those areas of mitigation which are included in the Mitigation Strategy. These mitigation projects would be approved and funded after following the prescribed procedure.

b) If certain areas are considered as a priority for mitigation, the Disaster Management Authorities at different levels can take up projects from respective mitigation funds.

c) The project cycle mentioned above would be the same for both the modes of project development are the same, except that there would some difference in the process of project appraisal.

3.5 Designing Mitigation Project

3.5.1 Project Identification:

a) A mitigation project is identified based on risks and their impacts. If a certain area is prone to floods or drought, the magnitude of risks is identified, their impacts analysed, and the mitigation solutions are suggested. If rationale for investment in mitigation can be established based on the expected impacts and cost-benefit analysis, a mitigation project can be proposed.

b) The Implementing Partner proposing the project must meet the eligibility criteria, mentioned in the previous chapter. The eligibility for preparing the proposal arises from the experience of working in the area of disaster management, technical capacity, community support and presence in the field.

c) The Implementing Partner applying for funds from the Mitigation Funds prepares the proposal in the template prescribed for the pre-feasibility check. The template is attached in the Annexure - II.

3.5.2 Pre-feasibility Check:

The Pre-feasibility check is the first stage of the appraisal and approval of the Mitigation projects. Projects below Rs. 1 crore will not need a pre-feasibility check.

a) All the project proposals prepared in the prescribed template are submitted to NDMF / SDMF.

a) Pre-feasibility check will be done by Project Appraisal Committees (PAC) constituted by NDMA/SDMA.

b) The pre-feasibility check would be conducted to understand the relevance of the project, its financial viability and technical feasibility. After the pre-feasibility check, NDMA / SDMA endorses or declines the proposal. If the NDMA/SDMA endorses the proposal, it leads to the next stage of the preparation of the Detailed Project Report. The NDMA / SDMA may also refer back the proposal for appropriate revisions.

c) The endorsement provided at the first stage does not confer approval upon the project. Such an endorsement implies an expression of interest on part of the NDMA / SDMA. The endorsement does not oblige the NDMA / SDMA to extend approval to the project at a later stage. The final decision related to project approval is taken based on technical quality, cost-effectiveness, project results, and availability of funds.

d) In a situation where the NDMA / SDMA has issued the EoI / RfP for a project proposed by the authority itself, such a pre-feasibility check is not needed.

e) The NDMA / SDMA will conduct a pre-feasibility check of the proposal submitted within 30 days from the submission of the proposal and conveys its decision to the Implementing Partner. Those projects are, which are below Rs. 1 crore, are required to submit a concept note, which will describe the essential details of the mitigation project. A detailed project report will be prepared only after the concept note is approved by the NDMA / SDMA.

3.5.3 Preparation of Detailed Project Report (DPR)

The DPR is a technical and financial document prepared with due diligence by the Implementing Partner. The DPR lays down the project goals, its activities, cost estimates and intended impacts in adequate details.

The DPR for mitigation projects is prepared in the prescribed template for this purpose, which is included in the Annexure. The formulation of DPR would require several steps:

a) A risk assessment of the identified hazard, risk exposure and accompanying vulnerabilities;

b) An analysis of the context—socio-economic, governance / regulatory, and environmental

c) An analysis of the stakeholders' capacities—technical, organizational, and financial

d) Activities planned under the project and the outputs

e) Cost-benefit analysis

f) Budget for the project activities

c) The endorsement provided at the first stage does not confer approval upon the project. Such an endorsement implies an expression of interest on part of the NDMA / SDMA. The endorsement does not oblige the NDMA / SDMA to extend approval to the project at a later stage. The final decision related to project approval is taken based on technical quality, cost-effectiveness, project results, and availability of funds.

d) In a situation where the NDMA / SDMA has issued the EoI / RfP for a project proposed by the authority itself, such a pre-feasibility check is not needed.

e) The NDMA / SDMA will conduct a pre-feasibility check of the proposal submitted within 30 days from the submission of the proposal and conveys its decision to the Implementing Partner. Those projects are, which are below Rs. 1 crore, are required to submit a concept note, which will describe the essential details of the mitigation project. A detailed project report will be prepared only after the concept note is approved by the NDMA / SDMA.

3.5.3 Preparation of Detailed Project Report (DPR)

The DPR is a technical and financial document prepared with due diligence by the Implementing Partner. The DPR lays down the project goals, its activities, cost estimates and intended impacts in adequate details.

The DPR for mitigation projects is prepared in the prescribed template for this purpose, which is included in the Annexure. The formulation of DPR would require several steps:

a) A risk assessment of the identified hazard, risk exposure and accompanying vulnerabilities;

b) An analysis of the context—socio-economic, governance / regulatory, and environmental

c) An analysis of the stakeholders' capacities—technical, organizational, and financial

d) Activities planned under the project and the outputs

e) Cost-benefit analysis

f) Budget for the project activities

g) Implementation plan and the timeline for the completion of the project

h) Reporting and monitoring arrangements

The Implementing Partner should normally incur the expenditure on the preparation of DPR. However, the NDMA / SDMA may consider allocating some funds for the preparation of DPR.

After the endorsement at the pre-feasibility check, the Implementing Partner is required to submit the DPR within the time limit prescribed by the authority. The DPR is submitted through a digital portal. Since the development of the digital portal may take time, the proposals for the current year may be submitted by the procedure laid down by NDMA/ SDMA.

3.6 Project Appraisal and Approval

a) Details regarding the structure and functions of Technical Appraisal Committee (TAC) and Project Appraisal Committee (PAC) are explained at section 5.2 and 5.3 of chapter 5.

b) The submitted DPRs will be appraised and reviewed by Technical Appraisal Committee (TAC) for all the technical, financial and social aspects of the project.

c) The TAC will review the proposal following a checklist, which will consist of the scope and scale of the project, eligibility of the Implementing Partners, appropriateness of mitigation measures, cost-effectiveness, expected results, implementation arrangements, community participation and social inclusion, and monitoring arrangements.

d) The TAC may ask for clarifications concerning the project, refer it back to the Implementing Partner for necessary revision.

e) Based on technical evaluation, the TAC may recommend it to the concerned NDMA / SDMAs. If the TAC is not satisfied with the project design, it may recommend that the project be not approved.

f) Once the DPR is recommended by the TAC, the NDMA / SDMA may follow internal mechanisms to process the approval of the mitigation project. If the PAC does not recommend the proposal, the NDMA / SDMA may refer it back to the

Implementing Partner for necessary modifications. The technical review and recommendation of TAC is a requisite condition for the approval of the DPR.

g) After technical appraisal of the project by the TAC, the appraisal of the project from administrative and financial point of view will be done by the Secretariat of the Authority. The Authority can set up Project Appraisal Committee (PAC) for this purpose, if required.

h) After technical and administrative appraisal of the project, it will be put up to the Authority for approval.

i) The operational guidelines issued by the MHA for the NDMF will govern the operation (approval, fund release, and utilization) of NDMF. These guidelines will govern the approval of mitigation projects in case of the Union Territories. The operational guidelines issued by the MHA for the SDMF will govern the operation (approval, fund release, and utilization) of SDMF.

j) The details of the Mitigation Projects which are approved are placed on the Mitigation portal so that the information and data related to the project are available in the public domain.

k) The process of review and approval through the TAC and the NDMA / SDMA will be completed within two months of the submission of the DPR.

l) The Disaster Management Authorities may decide to prioritize mitigation projects and accordingly make allocations, strictly within the overall annual financial allocations. Those projects which are approved but not funded may receive funding in subsequent years. For the second and subsequent years, the first charge would be towards the continuation of ongoing projects that were sanctioned in the first year.

m) Any proposal, other than part of national programme of NDMA, which States want to get funded from NDMF, may be sent to MHA for approval, after appraisal at NDMA.

3.7 Project Implementation

a) The Implementing Partner signs a project agreement with the Disaster Management Authority and undertakes to implement the project as per the

approved Implementation Plan in the DPR. A detailed project agreement is drawn up specifically for the mitigation project.

b) The Mitigation Project is implemented by a Project team, which will be constituted within one month of the project approval. The Implementing Partner informs the Disaster Management Authority of the Project Team as well as the Lead.

c) In those cases where more than one agency have partnered to implement the project, the Consortium informs the Disaster Management Authority of the project management arrangements and produce a formal consent from all the participating agencies to this effect. The Consortium designates a lead agency which coordinates with the Disaster Management Authority on all the issues related to the project.

d) The Implementing Partner hires the staff and deploys them for the project implementation. The Implementing Partner assumes the full responsibility for the service conditions and safety of the project staff. The Disaster Management Authority has no liability for the project staff.

e) The Implementing Partner submits an implementation plan, which lays down the time-frame for the completion of all the project activities. The project implementation must adhere to the time-frame mentioned in the plan. If the project needs to be extended, implementation partner will request the Disaster Management Authority for such an extension, who can take a decision on the matter.

f) The mitigation projects have an approved budget for all the activities included in the implementation plan. In addition to the budget, the fund flow for the project activities is decided in advance. The disbursement of the funds is linked to the activities and outputs and released in tranches as agreed with the implementing partner. All the financial decisions concerning unspent allocations or extension of projects will lie with the Disaster Management Authority.

g) In respect to procurement under the mitigation projects, Central and State agencies need to follow the rules and procedures laid down by the concerned

governments. The NGOs and other agencies outside the government adhere to their procurement processes.

h) The Disaster Management Authorities have the necessary authority to take suitable decisions if the mitigation project is delayed or being implemented incorrectly. The Disaster Management Authority reserves the right to terminate the Project at any stage and take legal action, if it is convinced that the grant has not been properly utilized or satisfactory progress is not being made.

i) The implementing partner ensures that there is no harm to the community in the process of implementing the project. It adheres to all the laws and regulations of the country and supports the government in ensuring compliance with all the rules and standards. The implementing partner works with the governments at all levels in a cooperative manner and respects the communities with which it works. It pursues fairness, equity and non-discrimination in its employment policies.

j) The implementing partner is responsible for the protection of forests, wildlife parks, rivers and wetlands, and any other natural or environment asset. The mitigation project aims to reduce not just the risks posed by hazards, but also addresses climate change impacts and reduces pollution and waste of natural resources.

k) The implementing partner must observe and uphold the values underlying the labour laws. In its work, the implementing partner must promote the ideals of gender equity and women's empowerment. Participation of the tribal communities and traditional forest dwellers need to be attempted, to utilize their local knowledge and traditional practices.

l) The implementing partner maintains all the rules and agreements related to intellectual property rights. All the publications and knowledge products emanating from the project cannot be disseminated without the permission of Disaster Management Authorities.

3.8 Project Monitoring & Evaluation (M&E)

a) All the mitigation projects have a monitoring and evaluation plan formulated during the preparation of the DPR. Project Monitoring is conducted throughout

the project implementation to measure the progress of the project towards achieving expected/planned objectives.

b) All mitigation projects submit a progress report and statements of expenditure in the prescribed format as prescribed by authority. The projects also submit necessary certificates of completion of the project and utilization of the project budget.

c) All the mitigation projects conduct a periodic review of the project, providing baseline information, mid-term review and the end-results evaluation upon the completion of the project. The mid-term review / evaluation and the project-end evaluation are conducted through external experts to get an objective picture of the project performance. The results of the mid-term review are used for improving the project results.

d) All the mitigation projects are evaluated for the results and their overall impact at their conclusion. The Implementing Partner reports the project results, which are evaluated externally for their adherence to project design and the outcome. All the review and evaluation reports are submitted to the mitigation portal.

e) All Mitigation projects have components of self-evaluation, where the Implementing Partners critically review the quality, relevance and effectiveness of the project activities they have implemented against the expected results.

f) NDMA may conduct an evaluation, including third party evaluation, of any project approved under NDMF / SDMF and publish the findings on the mitigation portal.

3.9 Project Audits

Based on the scale and nature of the projects, all the projects are taken up for financial and social audits as decided by the Disaster Management Authority.

- **Financial Audits** – A financial audit of the funds received and expenditure made will be carried out by the Comptroller and Auditor-General (CAG) of India.
- **Technical Audits** – The Disaster Management Authorities identify technical experts to conduct technical audits of all mitigation projects. Number of required audits will be decided by the authority as per size and complexity of the project. The mid-term

reviews and project-end evaluations should be undertaken by experts included in the roster for this purpose.

- **Social Audit** – Since most of the mitigation measures require community participation during its process, social audit will be conducted during the project cycle to review how the project has sought to involve the people at risk and deliver the results to communities, as prescribed by the authority.

3.10 National Mitigation Portal

NDMA shall develop a National Mitigation Portal to streamline the process and bring more transparency through utilization of digital technology. This Portal facilitates the various implementing agencies to submit their project proposals to be funded under mitigation funds. The portal also provides facility to track the status of the submitted project proposals, with locations duly geo-referenced, monitor the projects and upload periodic information on various stages of the project cycle.

Through this portal NDMA / SDMAs maintain a database of all the mitigation projects approved by the Disaster Management Authorities and funded by the NDMF/SDMF/DDMF. The database of the projects includes all the details related to project components, expenditure, reviews, evaluation and outcome.

Since the development of the digital portal may take time, the proposals for the financial year 2020-21 may be submitted by the procedures laid down by NDMA / SDMA.

Chapter 4
Governance Structure

The Mitigation Funds at all levels are supported by an appropriate governance structure. Various elements of the governance structure are necessary to ensure the impact of the investment in mitigation projects and accountability in the utilization of funds.

4.1 Mitigation Project Management Division (MPMD)

NDMA/SDMAs constitute mechanisms to coordinate project activities supported by Mitigation Funds. A key mechanism is Mitigation Project Management Division (MPMD) manned by competent technical personnel from amongst the available staff, through deputation or by hiring technical resource persons on a contractual basis. The suggested roles and responsibilities of the Mitigation Project Management Division (MPMD) at different levels are:

- Overall monitoring and coordination of mitigation projects at the national, state and district levels, and host decision support system for all the investments in mitigation;
- Setting up the Project Appraisal Committee (PAC) and Develop a Roster of Consultants for technical support;
- Inviting project proposals; conduct preliminary scrutiny and coordinate with the Project Appraisal Committee (PAC) for technical review of the project;
- Coordination with Project Approval Committee for appraisal of selected projects
- Monitoring of implementation of Mitigation Projects;
- Set-up and manage a National Mitigation Portal for submission, approval, funding and monitoring of the project proposals at all stages;
- Monitor fund utilization and facilitate Disaster Management Authorities to manage the Mitigation Funds, raise additional resources, and suggest improvement in Mitigation Strategy;
- Facilitate Research and Development in the field of Disaster Mitigation.

For MPMDs, all staff costs, except the consultants, will be borne by the NDMA / SDMAs. NDMF / SDMFs can engage the consultants for specific functions related to Mitigation Projects. Further, administrative and travel expenses of MPMDs may be met from NDMF/SDMF. The payment for management costs related to consultants, administrative charges, travel expenses, and Third-party quality evaluation can be done within a limit of 2% of NDMF/ SDMF allocation, with the NDMA/ SDMAs bearing any additional costs. For states with an annual allocation of SDMF fund up to Rs. 20 cr, the limit on management expenses will be 5% of SDMF allocation.

The administrative expenses of a MPMD include office expenses and procurement and maintenance of office equipment. However, expenditure on the purchase of vehicles, payment of salaries & wages and purchase or construction of buildings is not permissible through the proceeds of the Mitigation Funds.

States designate appropriate authorities/persons in districts/ministries/departments to coordinate with MPMDs in NDMA and SDMAs and to streamline the implementation of projects under Mitigation Funds. NDMA/SDMAs delegate financial resources and powers to the DDMAs to facilitate projects under Mitigation funds.

4.2 Technical Advisory Committee (TAC)

NDMA and SDMAs will constitute Technical Advisory Committees (TAC) to give overall technical guidance to NDMA / SDMA for design and development of mitigation project and refining the mitigation strategy. TAC to appraise projects from technical and social point of view and give its recommendations to the authority and to conduct technical review of projects sanctioned from mitigation funds and give recommendations for improvement.

The TACs will consist of members / officers of the authority (as may be decided by the authority) and technical experts from the disaster risk reduction and other relevant sectors. Some Disaster Management Experts may be invited for all the meetings for cross cutting perspective, while relevant hazard / theme experts may be invited for specific project appraisal meetings. TAC will also give expert technical advice on the mitigation strategy and action plan to reduce disaster risk

relating to the identified hazard. The NDMA / SDMAs can consult the TAC on technical aspects of the project and seek its opinion. The expenses of the TAC including honorarium to attend meetings, travel expenses etc will be borne from the mitigation funds.

4.3 Project Appraisal Committee (PAC)

The Disaster Management Authorities will constitute Project Appraisal Committees (PAC) for administrative, technical and financial appraisal of the projects. PAC may examine that the projects follow government guidelines and instruction to assist the Secretariat of Authority on any administrative or financial matters, which may be referred to the PAC. This committee appraises the project based on technical considerations and instructions issued by the Disaster Management Authorities.

a) The PACs consist of Members, of NDMA /SDMA, the officials, disaster management experts with experience in the field of disaster risk reduction and other relevant fields.
b) The PACs are responsible for a social, technical and financial review of the projects assigned to them by the Disaster Management Authorities and provide recommendations on the design, formulation and approval of the projects.
c) The PACs function on specific assignments and financial remuneration for their technical services, travel and subsistence costs of the members of the PAC are met through NDMF/ SDMFs.

4.4 Roster of Consultants

A Roster of consultants serves the need for technical services for Mitigation Projects. The Roster helps the NDMA and SDMAs in identifying qualified candidates based on the specific needs for a limited duration of time. The Implementing Partners can hire consultants from the Roster, and pay them directly NDMA/SDMAs can use these consultants to support technical review and audit, documentation, and development of technical guidelines or any other technical support required to oversee implementation of the project. The remuneration of these consultants may be borne from NDMF / SDMF as applicable.

Annexure

Annexure I – Few Hazard Specific Mitigation Measures

This guidelines are applicable to all the hazards as notified under NDRF / SDRF Guidelines, NDMF / SDMF guidelines and other state-specific hazards. The following list of mitigation measures is an indicative list of few hazards for ideas. The hazard specific mitigation guidelines will be shared separately.

NOTE: Small scale / local community level interventions of structural and non-structural measures to be covered under NDMF / SDMF where there is no dedicated Central / State level programme / project facilities available.

SN	TYPES OF HAZARD	MITIGATION MEASURES	
		STRUCTURAL	NON-STRUCTURAL
1	**Flood & Urban Flooding**	**Excess storm / rainwater can be dispersed / managed through the development of drainage structures:** • Improving natural flood protections around settlements through local interventions. • Plantations and afforestation over embankments. • Improvement of local storm water drains and traditional floods prevention system such as construction / maintenance of culverts, ring bunds, small check dams, revival of traditional irrigation systems etc to protect human habitation / houses thorough local community level initiatives, indigenous best practices and nature based solutions will make flood water	**Local Planning, Regulations and Guidelines** • Preparation of River Basin Flood Plains Management Plan at various levels. • Amendment of building codes, bye-laws for flood risk reduction and mitigation. • Preparation flood plain zoning regulations and its implementation at ground level. • Developing risk insurance and risk transfer strategies and promote flood insurance. • Protection of village common land in the river beds from encroachment. • Protection and revival of natural drains and drainage systems. • Need based planning and projects in urban areas. • Policy and planning for designing of roads, bridges and other infrastructure above the historic flood line

		management efficient by increasing water storage and drainage capacity. ◦ Bioengineered bank stabilization uses plants to reduce erosion on riverbanks as an engineering tool, creating a convergence of ecology and landscape engineering, with a long term impact. • Prioritize indigenous techniques used to store / harvest excess water can be built in areas with erratic rainfall patterns. ◦ Renovation of old water management infrastructure that may have been undermined because of development on demonstrative basis. • Improvement of urban systems to prevent flooding. • Need based planning and projects in urban areas. **Runoff Control Measures and Drainage Systems** • Providing new techniques for reducing all type of erosion and subsidence process and increase ground infiltration especially in urban areas. • Reconstructing all walkways as permeable pavements with the usage of material that enables percolation. • Creation of drainage networks that enable recharge of depleting aquifers. • Constructing water recycling mechanism that	will ensure connectivity for locals in case of floods and also response activities if required. • Developing insurance and risk transfer strategies that create a better economic ecosystem. • Creating local committees for hazard mitigation that look into land use management, green infrastructure, watershed management and policy planning for building codes & flood plain management etc. **Urban Planning** • Mapping encroached area that aid to blockage and relocating the population. • Identifying old water networks that help flow and refurbishing them. • Deploy technological systems of monitoring that ensure strict adherence to local codes. • Increasing awareness and infrastructure for rainwater harvesting. **Education and Awareness** • Installation of Weather and hydrological Stations and improvisation of flood warning systems. • Creation of Data bases for decision support systems (DSS) & disaster database. • Strengthening information and communication strategy at community level. • Policy and awareness campaign on flood management and water management techniques to reduce the occurrence of the hazard. • Increasing capacity of knowledge about the hazard in

			Promoting Earthquake Resilient Infrastructure • Promoting earthquake resilient infrastructure in earthquake-prone areas using earthquake resistant techniques. • Adoption of traditional knowledge and best practices amalgamating with modern technology. **Understand the risk of earthquake. Following measures can be undertaken:** • Mapping the geological factors like location of faults, soil composition and condition and related potential hazard. Modeling earthquake scenarios to estimate the potential loss to life and property. • Geo-tagging the critical infrastructure such as hospitals, fire stations, roads, etc. • Create and maintain a database to measure the vulnerabilities of the local population. Further, creating earthquake zonation maps depicting the vulnerable areas, evacuation points and routes and critical infrastructure. • Reviewing seismic zones to have an application-based approach of land use planning to achieve restricted construction in reviewed earthquake-prone areas. **Education and Awareness** • Conducting sessions/ workshops at schools, households and businesses to spread awareness about earthquake risk and mitigation activities. • Educating individuals on safety techniques to be

		ensures the usage of runoff water as grey water. • Using a land survey to identify low lying point is the city and develop a pumping mechanism for the same. **Innovate Natural Processes for Risk Reduction** • Encourage green roof tops that ensure the absorption of rainwater and reduction in pollution levels. • Flood plain management, expansion of development has led to a decrease in water absorption. Efficient management techniques will allow for reversing the process.	the community by various tools of community development. • Informing about new developments in flood safety through brochures and pamphlets. • Encourage use of insurance, maps and geological databases to study their region. • Sensitization and awareness about reducing the risk of floods through innovation techniques and efficient utilization of local resources.
2	**Earthquake**	**Protecting Existing Infrastructure** • Retrofitting of vulnerable critical infrastructure on demonstration basis such as schools, hospitals, houses, and utilities to make then earthquake-resilient • Identification and segregation of fragile structures which are not safe for living, for purpose of reconstruction or demolition. • Strengthening and retrofitting the non-reinforced brick buildings on demonstration basis those are vulnerable to earthquakes.	**Strengthening of Building Laws and Regulatory Framework** • Development of construction standards and codes which adhere to the latest technology for earthquake-resistant building techniques and techniques of retrofitting. • Develop a mechanism for regular inspection of old, under construction and new plan infrastructures to be constructed as per earthquake resilient standards. Share the recorded data with municipalities to address issues of faulty or poor standards of construction. • Making the latest standards for construction and revised BIS codes available to developers, builders and the general public.

			followed at the time of an earthquake by regular campaigns through IEC materials (print, electronic media). • Deploy risk transfer strategies for economic resilience by increasing awareness about earthquake insurance. • Educating homeowners about different structural and non-structural mitigation techniques to increase disaster resilience, like when and how to retrofit, how to make a seismically safe house, how to secure objects like cupboards, clocks, shelves etc. • Training and capacity building programs for masons, architects, engineers, builders, contractors and developers on earthquake-resilient materials and techniques of construction. • Promotion of Research and Development activities to develop new technology and study traditional knowledge / best practices measures to increase resilience to earthquakes. • Inclusion of Earthquake Mitigation measures in the Education Sector. • Documentation and Promotion of Local knowledge on Seismic safety in building construction.
3	Drought	**Developing Water Harvesting & Conservation Structures** • Promote ground water recharge and water harvesting structures such as the reconstruction of walkways as permeable pavements with the usage of material that enables percolation on demonstration basis. • Artificial recharging of ground water by local	**Local Planning and Regulations** • Identification of possible water supplies and capacity to calculate the demand to capacity ratio, concerning historic & present data. • Identifying local natural indicators like precipitation, temperature, surface moisture, humidity. • Assessment committee to be established that ensure proper collection of data for identification.

		interventions such as construction of contour trenches, contour bunds, boulder checks, gabion structures, spring shed development etc. on demonstration basis. **Implementation of Drought Control Measures** • Construction of shelters for cattle and development of infrastructure for storage and transportation of fodder on demonstrative basis. • Drought proofing a region by conducting afforestation and tree plantation drives, with plants that help in percolation. • Creating early warning systems that provide for adequate infrastructure for real-time dissemination of weather-based advisories to the farming community. **Strengthening of Local Infrastructure** • Creation of cost-effective and water preserving irrigation practices like drip & sprinkler irrigation. • Increasing employment by amplification of agro-based food processing industries in rural areas. **Innovation and Construction of Natural Designs** • Renovation and preservation of traditional water harvesting structure. • Building green rooftops and permeable	• Identifying, planning and procuring of required tangible\intangible material for drought-proofing before the onset of the dry season such as seeds and fodder, health kits, water availability plan, advance credit etc. • Mechanism for access of farmers to cold storage units. **Education and Awareness** • Conduct evaluation of local intervention and run sensitization programs on drought management. • Developing good farming practices by introducing drought-tolerant varieties of crops, crop planning with rotation and terrace & contour farming to save runoff etc. • Increase training and capacity building of communities in soft infrastructure like Women's Self-Help Groups (SHGs.) and farmer Joint Liability Groups etc. • Setting up community-level committees and association to ensure implementation of protocols, like Community-level Plans for Drought Mitigation. **Government Policies and Framework** • Establishing the mechanism for Construction of "Community/ Village Ponds" • Setup research programs in educational institutions to study forecasting of drought at the district level, in the chronically drought-affected areas. • Economic infrastructure to be built in a robust manner that provides credit, price support and insurance to farmers.

		surfaces, they ensure the absorption of rainwater and promote recharge.	• Updating insurance products specific to agro-climatic zones providing coverage against drought. • Hazard-zoning using 'Vulnerability Mapping' and **'Risk Assessment Analysis'**. • Inventory analysis mechanism to be set up for calculating locally available resources.
4	Cyclone	**Increase Resilience and Reduce Vulnerability** • Protection of seawalls and settlement from storm surges through local interventions. • Construction and maintenance of cyclone shelters and cattle mounds. • Building new infrastructure which is resilient to the effects of cyclones. **Modifying Existing Infrastructure** • Retrofitting of critical infrastructure like hospitals, roads, bridges etc. which are vulnerable to be made cyclone-resistant by applying appropriate technology on demonstration basis. • Underground installation of power cables and utility lines on demonstration basis. **Employing natural mitigation Measures** • Growing Bio-shields like mangroves, casuarinas Salicornia, Leucaena, a triplex, palms, bamboo and other tree species to protect against storm surges and high winds. • Deepening / cleaning of drain and canals wherever required.	**Local Planning and Regulation** • Identification of vulnerable locations, creating and maintenance of the database of vulnerabilities. • Modeling cyclone scenarios to assess the probable losses. • Creation of zonation maps to help in regulating construction and other activities. **Insurance** • Reducing the economic risk of the community through insurance schemes. **Education and Awareness** • Spreading awareness about the underlying risks by various tools of community engagement. • Informing the community about the latest development for cyclone safety through meeting/brochures/pamphlets. • Promoting insurance and its benefits. • Conduct workshops and trainings for capacity development to reduce the vulnerabilities of the people living in the coastal areas. **Improving Capacities**

		• Desilting of drainage, canals and water channels.	• Developing and using early warning systems to predict the onslaught of cyclones. • Promoting research and development for advanced technology to reduce vulnerability towards the impacts of cyclones. • Conducting training sessions for stakeholders on the available technology and measures for cyclone mitigation • Conducting workshops for first aid, using radios and satellite phones.
5	Landslides, Avalanche, GLOF & LLOF	**Risk Reduction through Natural Conditions** • Installation/ renovation of the drainage system/ correction measures to reduce erosion and slope movement by the surface and sub-surface water flow at vulnerable locations. • Reducing the water volume from highly vulnerable glacial lakes through interventions. • Reducing a general slope angle either by soil/debris/snow removal or adding material to reduce the risk of landslide and avalanche. Process of Buttress fills to prevent landslides and artificial drainage channel, culvert, siphoning etc. of highly vulnerable glacial lakes. • Setting up monitoring and early warning systems with latest technology. • Macro and micro level monitoring system using latest technologies. Setting up warning signs, barriers, etc. around landslides sites.	**Implementing Zonation and Land-use Plan** • Identifying hazard-prone areas based on parameters such as geology, lithology, slope, vulnerable glacial lakes, snow accumulation etc. • Preparation of inventory mapping of critical infrastructure and other vulnerable buildings. Development and maintenance of the database of vulnerable locations. • Using modeling technique to create the hazard scenarios to get an estimate of probable losses. Multi-hazards risk mapping and modelling of vulnerable areas. • Infrastructure planning based on probabilistic estimates of hazards. • Review/revision of existing codes/ standards, guidelines; and preparation of framework land use regulation for landslide mitigation and management. **Education and Awareness** • Spreading awareness about the underlying risks by

		Risk Reduction & Mitigation through Protection Measures • Site specific landslide risk mitigation such as construction of gravity retaining walls, crib-block walls, reinforced concrete walls to prevent problematic landslides. • Installing snow nets, snow bridges, snow fence and snow galleries to prevent avalanches at highly vulnerable sites. • Strengthening the glacial lake boundary through the construction of structural measures for vulnerable lakes. **Employing Natural Mitigation Measures** • Afforestation, especially using plants / vegetation (especially local species) which holds the soil firmly is the best natural protection measure. • Reclamation of barren slope by vegetation and improving drainage • Employing techniques to prevent surface erosion. • Deepening / cleaning of the drainage channels and spill ways.	various tools of community engagement. • Informing the community about the latest development to reduce risk of landslide/ avalanche/ Glacial Lake Outburst Flood (GLOF)/ Landslide Lake Outburst Flood (LLOF) safety by wide publicity through IEC materials (print and electronic media) and capacity building. • Sensitization and Capacity building of line departments, local community and other stakeholders on different aspects of risk reduction and mitigation strategy. • Promoting insurance and its benefits. **Improving Capacities** • Research and development of the techniques to control the hazards. • Conducting trainings of government employees on the latest development of the mitigation measures
6	**Lightning**	**Strengthening of critical infrastructure to reduce the vulnerability** • Promotion and use of lightning conductors in public infrastructures and houses.	**Local Planning and Zonation** • Assessment of vulnerable hot spots and risk. • Zonation map of occurrence of lightening hazards. **Education and Awareness** • Capacity building / training and public sensitization

			towards lightning and steps to be taken during construction, planning and other purposes for its mitigation.
7	**Miscellaneous** - Any other subject and State specific hazards as per Government notification may be considered.	**Strengthening of critical infrastructure to reduce the vulnerability** • Small scale pilot demonstrative mitigation project with defined outcomes and lessons learnt. • Plantations and afforestation, waste land management, prevention of desertification.	**Local Planning and Zonation** • Preparation of plans and zonation maps. • GIS based risk mapping of different hazards. • Development and promotion of multi-hazard risk zonation maps, showing applicable codes, regulations, and guidelines. • Planning for comprehensive relocation of population from vulnerable zones susceptible to disasters. • Identify mechanism for continuing education of orphan and widower livelihood. **Education and Awareness** • Awareness generation, capacity Building programmes including Psychosocial Care and Social Vulnerability Reduction. Mechanism should be developed to utilise the funds for addressing the behavioural aspects of facing disasters among the school children, women, elderly and differently abled. • Capacity Building on GIS tools and techniques can be utilized in Disaster Mitigation modelling. • Building a network of research institutions and knowledge base. • R&D projects for mitigation measures of various disasters.

Annexure II Template - Pre-Feasibility Check

Name of Project

Fund

- ☐ National Disaster Mitigation Fund
- ☐ State Disaster Mitigation Fund

For Official Use

Project Code

Project Assigned to

1	Applicant Details				
1.1	Name of the Applicant Department/ Organisation				
1.2	Type of Organisation	☐ Government Department ☐ PSU ☐ Academic/Research Institutions ☐ Non-Governmental Organisation ☐ Others			
1.3	Address				
1.4	State				
1.5	District				
1.6	City				
1.7	Pin-Code				
1.8	Project - Point of Contact				
1.9	Name	Designation	Phone number	Email	
1.9.1					
1.9.2					
1.9.3					
1.9.5					
2	Organisation Legal Profile (To be filled by PSU/ Research Institutions/ NGO etc)				

2.1	Legal Status of Organization
2.2	Nature of business in India
2.3	Date of Incorporation
2.4	Registrar of Companies - Reference No/ NGO Registration Number
2.5	Address of the Headquarters
2.6	Address of the Registered Office in India
2.7	Any other relevant information
4	Implementation Experience 3 (Information of 3 projects of similar nature or scale in the last 5 years)
4.1	Project 1
4.1.1	Name of Client
4.1.2	Name of the person who can be referred to from Clients' side, with name, designation, postal address, contact phone, e-mail id,
4.1.3	Scope of the Project
4.1.4	Project Value in INR
4.1.5	Project Stating date

5	Project Overview		
5.1	Project Title		
5.2	State		
5.4	Hazard		
5.5	Hazard Profile of Area Proposed*(200 words max)*	Guiding Question What is the history of the hazard in the region? What has been the impact on the life, livelihood and economy of the region	
5.6	Project Rationale (200 words max)		
5.7	Mitigation Measure	☐ Structural ☐ Non-Structural	Type of Project ☐ Structure and Infrastructure Projects ☐ Local Planning. and Regulations

☐ Natural System Protection

☐ Education and Awareness Program

5.8	Project Description (500 words max)		
5.9	Project Objective		
5.10	Project Goals		
5.11	Project Activities		
5.12	Project Partners		
5.13	Impact Indicators		
5.14	Proposed Human Resource		
5.14.1	Area of Expertise	Number of Resources (Part-time)	Number of Resource (Full time)
5.14.1.1			
5.14.1.2			
5.14.1.3			
5.15	Approximate project Duration (In Months)		
5.16	Approximate Budget (INR in Lakhs) Detailed head-wise budget along with justification may be attached in Annexure		

6	Document Checklist (As applicable)
6.1	Cover Letter / Endorsement
6.2	Certificate of Registration / Incorporation
6.3	Copy of PAN
6.4	Copy of GST
6.5	Company Profile with Contact details
6.6	Certificate of Incorporation from Registrar Of Companies(ROC) Relevant sections of Memorandum of Association of the company or filings to the stock exchanges to indicate the nature of business of the company/ NGO registration Certificate

6.7 Audited financial statements for the last three financial years;

6.8 Supporting Documents for Project Implementation Experience (Relevant documents (MoU, Contract Documents etc, Work order + Completion certificate OR Self Certificate of Completion(Certified by Statutory Auditor) OR Phase Completion Certificate (for ongoing projects from the Client)I issued by the Client/ Donor/

6.9 Expression of Interest for Partnerships

Annexure III Template - Detailed Project Report (DPR)

1. Applicant Details

2. Project Details

2.1 Project Overview

Project Title

Type Of Project ☐ Infrastructure Project ☐ Non-Infrastructure Project ☐ Mixed Project

Total Estimated Budget

Duration Of The Project

2.2 Project Description

Summary Of The Project (Summarize The Project Scope, Rationale And Activities)

Goals(Describe The Overall Goals That The Project Proposes To Achieve)

Project Location

Site No.	Village	Block	District	State	Geographical Coordinates

Objectives And Outcomes (Describe The Outcomes To Be Achieved To Fulfil The Goal And The Objectives Of The Outcome)

Objective 1	Outcome 1
	Outcome 2
	Outcome 3
Objective 2	Outcome 1
	Outcome 2
	Outcome 3
Objective 3	Outcome 1
	Outcome 2
	Outcome 3

Assessments and Other Details
Hazard Assessment (Type of hazard, history of hazard, name of the methodology followed for assessment and summary of result)- attach assessment report

Vulnerability and Capacities Assessment (Vulnerabilities and Capacities assessed- physical, social, economic and ecological, methodologies followed and summary of the number of affected people, infrastructure, household, public assets, ecological zones. Must include details of community interaction- number of surveys, discussions and interviews and their result)- attach assessment report and sample questionnaire

RISK ASSESSMENT (Applicant must describe the rationale for choosing the particular project, detailing the project costs and benefits (qualitative and quantitative)- attach assessment report including options analysis and cost and benefit analysis

Stakeholder Analysis (Applicant must provide a detailed stakeholder analysis, where all the stakeholder sin the project are identified, listed and their role in the project is analysed.)

Mitigation Strategy (Applicant must identify mitigation strategy adopted to address the risk, list out all the mitigation measures that are adopted and justify rationale for the same. Explain How the proponent plans to achieve the objectives and outcomes, attach preliminary designs for infrastructure projects, maps in case of ecological projects,))

Cost-benefit Analysis (Conduct a Social- Cost benefit analysis which includes qualitative and quantitative analysis of impact of the project.)

Planned Activities (Applicant must list out all the proposed activities to meet mitigation strategy)

Implementation Plan (Provide a detailed project implementation plan, Gantt chart etc to demarcate all the millstones to be achieved in the project on weekly basis.)

Budget for Project Activities (Submit a detailed budget document required

Reporting and Monitoring Arrangements (Submit detailed monitoring plan mentioning indicators against each objective that needs to be achieved, timeline for each evaluation etc.)

Conflict of Interest. (For any reason the current project may have similar criteria as any other running project or if the project may result in an unfair situation for any involved stakeholder, this must be mentioned at the here)

PROJECT BUDGET/COST OVERVIEW

Breakdown of costs

S.no.	Objective/ activity.	Amount

Grand total (a)

Ineligible cost (B)

Contribution from other Sources (C)

Total eligible project cost (a-b-c)

Fund requested from Mitigation Fund

4.2 How the costs been determined? (attach cost determination report)

Detailed cost estimate ☐ Tender Quotations ☐ Benchmark Rates ☐ Other ☐

MONITORING AND EVALUATION (M&E) Template

INDICATOR	DESCRIPTION	OUTPUT

ATTACHED DOCUMENT CHECKLIST

Section	Document	Attached?	
3.1	Hazard Assessment Report	Yes ☐	No ☐
3.2	Vulnerability Assessment Report	Yes ☐	No ☐
	Community Interaction Report	Yes ☐	No ☐
	Sample Questionnaire	Yes ☐	No ☐
3.3	Risk Assessment Report	Yes ☐	No ☐
	Option Analysis	Yes ☐	No ☐
	Cost-Benefit Analysis	Yes ☐	No ☐
3.5	Preliminary Design for Infrastructure Projects	Yes ☐	No ☐
3.6	Project Plan	Yes ☐	No ☐
4.2	Cost Determination Report	Yes ☐	No ☐
	List of all references used for research data	Yes ☐	No ☐

No. 33-02/2020-NDM-I(Pt.)-1513-1514
Government of India Ministry of Home Affairs,
(Disaster Management Division)

NDCC-II Building, B Wing,3 rd Floor,
Jai Singh Road, New Delhi-110001

Dated the 16th October, 2023

To

The Chief Secretary
ACS/Principal Secretary/Secretary, Disaster Management
(All States)

Sub: - Detailed list of mitigation activities which can be carried out under National Disaster Mitigation Fund (NDMF) / State Disaster Mitigation Fund (SDMF).

Sir,

I am directed to refer to the guidelines on Constitution and Administration of NDMF and SDMF issued vide this Ministry's letter dated 28.02.2022 and 14.01.2022 respectively. In the guidelines, the list of mitigation activities which can be taken up under NDMF / SDMF was not included.

2. Reference in this regard is invited to para-8.46 of Fifteenth Finance Commission's report which envisages that Ministry of Home Affairs, in consultation with NDMA, may issue a detailed list of mitigation activities as part of the guidelines of the Mitigation Fund. **An indicative list of mitigation activities is also provided by the Commission at Annex 8.2 of its report (copy enclosed).**

3. Further NDMA vide their letter number 5-20/2014-Mit/8082(E111264) dated 06/03/2023 have also circulated the guidelines titled "Guidelines for National Disaster Mitigation Fund (NDMF) and State Disaster Mitigation Fund (SDMF)" for guidance of the State Governments. The Part A of the guidelines comprised "Guidelines on Constitution and Administration of NDMF & SDMF" issued by MHA dated 14.01.2022 and 28.02.2022. Part B comprised 'Guidelines for Preparation of Disaster Mitigation Project under NDMF and SDMF". In the **Annexure I list of few hazard specific mitigation measures through an indicative list of activities/projects which can be taken up were also formed part of the guidelines circulated.** The States were requested to send proposal for funding under NDMF to NDMA for appraisal. The States were also specifically requested to expedite the process especially for earmarked funds under NDMF as recommended by the XVth Finance Commission.

16/10/2023

1/2

4. It is once again requested that the State Governments may formulate projects/activities expeditiously as per the guidelines issued by this Ministry and NDMA and send the proposals, using the indicative lists of activities, to NDMA for appraisal at the earliest. The list of activities, are once again enclosed for reference.

Encl: As above.

Yours faithfully,

16/10/2023

(Ashish Kumar Singh)
Under Secretary to the Govt. of India
Telefax:011-23438144
Email Id: usdm3-mha@nic.in

Copy to:

Member & HoD, National Disaster Management Authority, NDMA Bhawan, A-1, Safdarjung Enclave, New Delhi- 110029 with request that additional list of mitigation activities which can be carried out under NDMF / SDMF covering fire, tsunami, hailstorm, cloudburst, pest attack and frost & Cold Wave may also be formulated and arranged to be circulated to the States at the earliest.

Annex 8.2
(para 8.46 and 8.106)

Indicative List of Mitigation Activities under NDMF/SDMF

Hazards	Sl. No.	Mitigation Measures	Nodal Agency
Floods	1.	Improving flood warning system	State/Union
	2.	Preparation of floodplains management plan	State/Union
	3.	Improving natural flood defences around settlements	State/Union
	4.	Raising the plinth of houses	State/Union
	5.	Improvement of natural drainage	State/Union
	6.	Improvement of local and storm water drainage	State/Union
	7.	Construction of culverts and cross-drainage	State/Union
	8.	Deepening of water tanks, ponds and other storage	panchayati raj institution
	9.	Plantations and afforestation	panchayati raj institution
	10.	Installation of weather and hydrological stations	State/Union
	11.	Construction of flood shelter for the people	panchayati raj institution
	12.	Construction of cattle shelter	panchayati raj institution
	13.	Promotion and incentive for flood insurance	panchayati raj institution
Earthquake	14.	Review of seismic zones in India	State/Union
	15.	Preparation of land use plans at the State, district and city levels	State/Union
	16.	Reviewing and updating building codes, guidelines, manuals and byelaws and their implementation in cities, towns and villages	State/Union
	17.	Improving building permission system for inclusion of seismic safety	State/Union
	18.	Retrofitting of buildings in seismic high-risk areas	State/Union

	19.	Retrofitting of weak structures in highly seismic zones	State/Union
	20.	Training and certification of engineers and masons in earthquake engineering	State/Union
	21.	Evolving educational curricula in architecture and engineering institutions and technical training in polytechnics	State/Union
	22.	Setting up demonstration centres in seismic safety	State/Union
	23.	Education and public awareness of seismic safety	State/Union
	24.	Promotion and incentive for earthquake insurance	panchayati raj institution
Cyclone and Other Local Wind Hazards	25.	Review and enforcement of building rules that include cyclone resilient features in coastal cities, towns and villages	State/Union
	26.	Setting up Coastal Zone Regulatory Authority at the State level covering the coastline for management of marine resources and reserve forests	State/Union
	27.	Developing and enforcing Coastal Regulation Zone norms	State/Union
	28.	Support for shelterbelt plantations, coastal vegetation and green cover	State/Union
	29.	Support for underground power cable and utility lines at the household and community level	State/Union
	30.	Support for alternative channels of communications including very high frequency/ultra-high frequency (VHF/UHF) sets, satellite phones, radio, community radio, internet and loud speakers for communication during the cyclone	State/Union
	31.	Robust telecom systems wherein coastal mobile towers must be able to bear winds at speeds of 250 km/hour	State/Union
	32.	Last mile connectivity with the villages	State/Union
	33.	Delineation of evacuation routes prior to onset of cyclone season	State/Union
	34.	Development of suitable guidelines for hoardings and similar devices	State/Union
Drought	35.	Comprehensive State insurance cover needs to be provided for persons, their properties and cattle	State/Union

	36.	Setting up drought early warning system	State/Union
	37.	Decision support system for monitoring and managing drought	State/Union
	38.	Community-level plans for drought mitigation	panchayati raj institution
	39.	Improving water harvesting and conservation through artificial recharge of groundwater and traditional methods at the community level	panchayati raj institution
	40.	Alternative crop planning	panchayati raj institution
	41.	Improving percolation tanks	panchayati raj institution
	42.	Improving village ponds/tanks	panchayati raj institution
	43.	Rainwater and roof water harvesting systems	panchayati raj institution
	44.	Drip and sprinkler irrigation system	panchayati raj institution
	45.	Afforestation and plantation	panchayati raj institution
	46.	Monitoring reservoirs and setting up reservoir management system	panchayati raj institution
	47.	Setting up water users association	panchayati raj institution
	48.	Conjunctive use of surface and groundwater	State/Union
Landslide	49.	Geological reconnaissance and mapping of landslide-prone areas	State/Union
	50.	State-level monitoring system for landslides	State/Union
	51.	Site investigations with borings and test pits and slope stability analysis	State/Union
	52.	Slope stabilisation measures through plantations, stone pitching	State/Union
	53.	Improving natural drainage on slopes	State/Union
	54.	Anti-erosion measures	State/Union

	55.	Settlement planning based on landslide susceptibility	State/Union
	56.	Infrastructure planning based on probabilistic estimates of landslides	State/Union
	57.	Setting up warning signs on landslides	State/Union
Lighting	58.	Identify the geographical spread of lightning hazard	State/Union
	59.	Setting up a network of lightning conductors	panchayati raj institution
	60.	Issuing public warning of lightning events	panchayati raj institution
	61.	Public awareness of lightning hazard	panchayati raj institution
Glacier Lake Outburst Flood (GLOF), Avalanche and Other Mountain Hazards	62.	Setting up monitoring and early warning systems	State/Union
	63.	Plantations and Afforestation	panchayati raj institution
	64.	Settlement planning based on hazard susceptibility	State/Union