



Strengthening State Preparedness for Disaster Risk Management

Abstract

This policy brief provides a holistic picture of the status of preparedness of Madhya Pradesh for disasters. State has a varied hazard profile and various instruments like plans and policies, community, institutions that take action to manage the disaster risk. The brief also highlights the financial provisions for the State as stated in the XV finance commission. The policy brief concludes way forward through recommendations to further strengthen the state preparedness for disasters.

Madhya Pradesh Rajya Niti Aayog policy briefs are prepared on specific policy issues on contemporary social, economic and governance issues for policymakers. This Policy Brief has been developed with valuable inputs and guidance from Shri B.S. Jamod - CEO, MP Rajya NITI Aayog. The author is also thankful to Shri Sunil Agarwal - Principal Advisor & Shri Deepak Asai – Advisor, MP Rajya NITI Aayog for their valuable feedback.

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Strengthening State Preparedness for Disaster Risk Management

Few catastrophic events in the history of India led to the evolution of Disaster Management in India. The worst industrial disaster that happened in the history of India was the Bhopal Gas Tragedy 1984. The leakage of toxic methyl isocyanate from a chemical plant led to killing of thousands of people in the city and significant morbidity. Following this event, the Environment Protection Act was passed in 1986 with the aim to protect and improve human environment and the prevention of hazards to human beings, other living creatures, plants and property. In the aftermath of this disaster, the Disaster Management Institute (DMI) was set up in 1987 by the Government of Madhya Pradesh as an autonomous organization to ensure that such events never recur in the future.

On 23 December 2005, the Government of India enacted the Disaster Management Act, which envisaged the creation of National Disaster Management Authority (NDMA), headed by the Prime Minister, and State Disaster Management Authorities (SDMAs) headed by respective Chief Ministers, to spearhead and implement a holistic and integrated approach to disaster management in India.¹

In 2009, the National Policy on Disaster Management was approved. In 2016, the National Disaster Management Plan was released which was revised in 2019. Hon'ble Prime Minister of India, Mr. Narendra Modi laid down the 10-point agenda for efforts

towards disaster risk reduction, which was delivered at the Asian Ministerial Conference on Disaster Risk Reduction (Annex 1). The Sendai Framework for Disaster Risk Reduction (SFDRR) 2015-2030 is the global blueprint to prevent new and reduce existing disaster risk. India is signatory to SFDRR which puts forward 4 priority actions and 7 global targets (Annex 2). The technical priorities of the SFDRR sit alongside the broader development approach of the Sustainable Development Goals (Linkages with SDG 1, 11 & 13 as shown in Annex 3). The National Disaster Management Plan (NDMP, 2016) is one of the first national level plans which is aligned to the SFDRR.

Hazard Profile of Madhya Pradesh

The State of Madhya Pradesh is mainly prone to flood and drought hazard. The major flood prone rivers are Chambal, Ken, Betwa, Narmada, Tapti and Mahi. The state faced major floods in 2013 and 2019 causing loss of life and property. Many parts of the State are susceptible to recurring drought conditions. The Bundelkhand region of Madhya Pradesh has a history of droughts. In 2019, 36 districts faced acute drought situation and water scarcity. The spatial distribution of the rainfall remains highly skewed with some districts experiencing drought situation, while rest of the state reels under heavy rainfall and floods. (Prajapati, 2020)

Madhya Pradesh is a forest rich State and has the area-wise largest forest cover in the country. According to the State Forest Report 2019, approx. 35% of the total forest cover is extremely to moderately fire prone. As per

¹ <https://ndma.gov.in/about-us/introduction>

the Forest Survey Report 2020-21, Madhya Pradesh is the second State where maximum number of forest fires (47,795) were detected using SNPP-VIIRS sensors from Nov 2020 to Jun 2021. State has highest number of national parks and is the tiger reserve of India. Forests are the asset for the wildlife and incidents of forest fire impact the flora fauna greatly. In 2021, a forest fire raged out in the Bandhavgarh national park.

Madhya Pradesh is also biggest victim of lightning hazard. The State continues to be at the top with highest lightning strikes (count 655788) in 2021-22 and highest reported deaths (496) in 2021. The state has highest 20 years average of lightning deaths (2001-2020) which is 315.45 (CROPC, 2022). Mostly the casualties are from rural areas mainly of farmers, cattle grazers, fishermen, tribal and labourers working in open.

Madhya Pradesh also faces the extreme heat hazard. The state lies in the heatwave zone of India. Average number of Severe Heat wave/ Heat wave days reported during last 5 years (2018-2022) were 7, 13, 2, 1, 13 respectively. There is a marked relationship between human mortality and thermal stress caused due to such events. Districts like Chhatarpur and Ratlam have experienced temperatures as high as 48- degrees (in 2022) and 45.5-degrees (in 2023) respectively, recorded as second highest temperature in the country after Rajasthan. During 2022, extreme temperature in Datia, Morena and Tikamgarh districts of Madhya Pradesh resulted in early maturity and lower grain weight of wheat and chickpea. Severe flower and fruit drop, reduction of fruit size was observed in mango in

Tikamgarh district. (Bal, Prasad, & Singh, 2022) Earthquake events in the state are uncommon. 36% of the state area lie in moderate risk earthquake zone III. Most of the seismic activity is confined to the Narmada-Son fault zone which runs across the state. Jabalpur earthquake of 1997 was the last notable earthquake that happened in the state. It was the first major earthquake to be centred near a densely populated urban area of the state. Given the unpredictable nature of earthquakes, seismic micro zonation of Jabalpur city has been done. Earthquake risks of urban areas can be assessed in a comprehensive manner through seismic micro-zonation studies in high resolution. This makes it possible to assess variations in seismic hazards within cities and develop appropriate land use and building regulations for earthquake resistance and safety. Micro zonation of Indore city is also ongoing.²

Apart from the above-mentioned major hazards, state is also vulnerable to other hazards like cold waves, hailstorm, industrial, fire accidents, etc. The table below shows number of deaths due to hazards in the state.

Table 1: Loss of life due to various hazards

Year	Floods	Lightning	Heat stroke	Cold exposure
2022	15	496	27	24
2021	12	496	2	22
2020	11	429	7	19
2019	27	400	33	21
2018	8	381	15	18
2017	15	452	34	28

(Source: Accidental Deaths & Suicide in India, NCRB)

² Disaster Risk and Resilience in India, MHA and UNDP, 2019

State Action in Disaster Risk Management

Community involvement

Realizing the importance of community as immediate first responder in case of any disaster, before any government or outside support reaches, National Disaster Management Authority initiated Aapda Mitra Scheme to train volunteers at community level especially those residing in the most flood prone districts of the country. The scheme was launched in 2016 with a focus of training 6000 community volunteers (200 volunteers per district) in disaster response in selected 30 most flood prone districts of 25 States of India. From Madhya Pradesh, the district of Hoshangabad was selected wherein 150 community volunteers were trained. In the second phase of the scheme, called the 'Up-scaling of Aapda Mitra', 11 districts of Madhya Pradesh are selected namely: Barwani, Bhopal, Chhatarpur, Damoh, Guna, Khandwa, Raisen, Rajgarh, Singrauli, Ujjain, and Vidisha. 300 community volunteers have been trained in each district (total 3300 volunteers). These trained community volunteers can assist in saving lives using the basic techniques of disaster response, coordination and management. Each volunteer is provided with a personal protective equipment/emergency responder kit and group insurance covering life and medical facility.

Madhya Pradesh has a strong establishment of Self Help Groups (SHGs) in which women are significantly involved. There are 4.42 lakh SHGs across the State involving more than 52 lakh members³. SHGs could be an

³ NRLM SHG data <https://nrlm.gov.in/shgOuterReports.do?methodName=showShgreport>

effective launch-pad to encourage women's participation in disaster risk reduction activities. SHGs can form a strong channel of communication, taking the message of disaster preparedness to everyone in the community, leaving no one behind. In disaster management women are considered as vulnerable section of society but women are not naturally vulnerable, they have been socially vulnerable. The best example of SHG proactiveness and entrepreneurial zeal was seen during the COVID 19 disaster. The micro-enterprises supported by DAY-NRLM took up the production of hand sanitisers and hand wash products to ensure the availability in rural areas. Madhya Pradesh was in top three states to produce highest quantity of sanitisers⁴. SHG members helped Madhya Pradesh become one of the five states to successfully set-up hundreds and thousands of kitchens/Didi's cafes to serve needy people during the lockdown. This kitchen network in every Gram Panchayat, with the support of local authorities, provided meals to thousands of underprivileged individuals⁵.

The state has a good strength of State Disaster Emergency Response Force (SDERF) and home guards, who play a major role in case a disaster has happened. They are well trained and well equipped to effectively respond and carry out rescue operations. Along with this, volunteers from civil defence, NSS, NYKS also contribute in case of emergency or disaster. They can volunteer as first responders amongst the youth and develop capacity to meet emergencies and natural

⁴ Press Information Bureau, Ministry of Rural Development, 12 Apr 2020

⁵ <https://www.thestatesman.com/india/shgs-mp-towards-new-journey-1503045103.html>

disasters. The table here shows the strength of these organisations in terms of number of volunteers in the state.

Table 2: Strength of various organizations	
Organisation	Strength⁶ (No. of volunteers)
SDERF	616
Home Guards	7957
Civil Defence	9738
NYKS	162250
NSS	159300

Madhya Pradesh also has a network of 7917 CSOs working in various sectors out of which 1002 CSOs are involved in Disaster Management⁷.

Institutional Structure

Bhopal gas tragedy is the major disaster associated with the state of Madhya Pradesh. But every disaster brings an opportunity to learn. In the aftermath of this disaster, DMI was set up as one of the first institute in the area of disaster management at national level with prime objective to conduct training and capacity building programmes in disaster management and related subject. It is recognized as Centre of Excellence in “Management of Chemical Accidents” and as one of the few third-party inspection agencies (TPIAS) for certification of Emergency Response and Disaster Management Plan (ERDMP) documents for midstream and downstream activities of oil and gas sector.

State Disaster Management Authority was notified in 2007 under the chairmanship of Hon’ Chief Minister of the State. Likewise

⁶ SDERF- <https://ndma.gov.in/Response/SDRF>
Home Guards- <https://dgfscdhg.gov.in/hgstrength-in-country->
Civil Defence- <https://dgfscdhg.gov.in/cd-volunteers>

State Executive Agency is formed under the chairmanship of Chief Secretary of the State for coordination of disaster related works, and all districts have District Disaster Management Authority under the chairmanship of District Collectors. Home Department of the Govt. of Madhya Pradesh is the nodal department for disaster management. All districts also have an Emergency Operation Centre (EoCs) where home guards and SDERF teams are stationed. Office of the Relief Commissioner is also established under the Revenue Department for the purpose of collecting data and information about the damage caused by natural disasters in the state and providing prompt relief to the disaster affected people and continuously monitoring the relief activities.

Madhya Pradesh has a state-of-the-art situation room for monitoring disaster situations, located at Vallabh Bhawan, Bhopal (also called VBSR). From this situation room, state officials can monitor any location in the State, traffic conditions, level of water in dams, crowding at religious places or events, etc. The VBSR receives live feeds from all the CCTVs installed in the State by different departments like traffic police, urban administration, etc. The Indian Meteorological Department that provides weather alerts is also connected with VBSR. The VBSR is connected with the Command and Control Centre in many districts. In case of events like flood, fire accident, etc. the District Collectors of affected districts can directly communicate with the concerned in VBSR.

NYKS- <https://nyks.nic.in/NewInitiatives/CoronaVirus/CoronaVolunteer/Default.aspx>
NSS- <https://nss.gov.in/nss-volunteer>
⁷ <https://ngodarpan.gov.in/index.php/search/>

Existing Plans & Policies

In 2002, the State Department of Revenue issued the Disaster Management Policy. Later there was a change in institutional structure and the Home Department of the Govt. of Madhya Pradesh was identified as the nodal department for disaster management. In view of the new arrangements, the State's Disaster Management Policy was revised (*year not clear*). State Disaster Management Plan was prepared in the year 2012.

There has been a growing trend of climate induced disasters like floods, droughts, cyclones, forest fires, etc. To combat the impact of climate change, India has launched the National Action Plan on Climate Change (NAPCC) in 2008. Climate actions at the State level are based on the State Action Plans on Climate Change (SAPCC). The state of Madhya Pradesh also has in place a SAPCC revised in line with the NDCs. Going at a deeper level, Climate Action Plans (CAPs) of all the 7 smart cities of MP are prepared.

Financial Provisions for Disaster Risk Management

The fifteenth finance commission (XV FC)

determines fund allocation for disaster management to the State Governments. The XV FC followed a departure from the expenditure-based approach to a new methodology, which is a combination of capacity, risk exposure (area and population) and hazard and vulnerability (disaster risk index) for determining State-wise allocation for disaster management. In this index, Madhya Pradesh has a reasonably high score of 60.

The State Governments incur most of the expenditures on disaster management, they are provided with the State Disaster Risk Management Fund (SDRMF) which includes State Disaster Response Fund (SDRF) and State Disaster Mitigation Fund (SDMF) with a break-up of 80% and 20% respectively; covering full cycle of disaster management (both relief and mitigation process). When States exhaust these resources, they can request financial assistance through the National Disaster Risk Management Fund (NDRMF).

Madhya Pradesh has been allocated a total amount of Rs. 13411 Cr. for 5 year period as shown below. Total amount of SDRMF of all states and NDRMF is also shown in the table.

Table 3: Annual Allocation for Disaster Management- SDRMF (in Crores)						
Year	2021-22	2022-23	2023-24	2024-25	2025-26	Total (2021-26)
Madhya Pradesh	2427	2548	2676	2810	2950	13411
- Union's share	1820	1911	2007	2108	2213	10059
- State's share	607	637	669	702	737	3352
All States	28983	30431	31957	33552	35230	160153
NDRMF	12390	13010	13660	14343	15060	68463

(Source: XV Finance Commission, Report for 2021-26, Vol. I, 2020)

The XV finance commission also recognises the importance of local communities and their participation in management of disasters. In the current scenario, government agencies take sole responsibility for disaster management activities and thus a shift from this top-down approach is required and this can be done by empowering panchayati raj institutions for disaster preparedness and management. The Commission considers the role of panchayats crucial in view of their proximity to the local community. Involvement of panchayats will lead to enhanced effectiveness of management activities like rescue operation, relief distribution, rehabilitation, etc. They can undertake several risk mitigation activities far more effectively. Therefore, some mitigation activities out of the proposed indicative list of activities (mentioned in Annex 8.2 of the XV FC report) are left to the panchayats rather than being taken up by the Union or State Governments. The Commission suggests that State Governments should allocate some reasonable amount out of the SDRMF allocation to the districts. These financial mechanisms would strengthen a decentralised approach to disaster management.

Under the NDRMF, six types of earmarked allocations have been done. Out of these six, two scheme allocations are applicable and can be utilized by the State of Madhya Pradesh. One under NDRF (Expansion and Modernisation of Fire Services) and one under NDMF (Catalytic Assistance to Twelve Most Drought-prone States).

- **Expansion and Modernisation of Fire Services**

Scheme for Expansion and Modernization

of Fire Services has been launched in 2023 for strengthening fire services in the States for the period upto 2025-26, with a total outlay of Rs. 5,000 Crore. States need to apply for these funds, for which they shall contribute 10% of the amount sought. Broadly identified activities under the scheme include setting up of new fire stations, strengthening of State Training Centres and capacity building, provisions for modern fire-fighting equipment, strengthening of State Headquarters and Urban Fire Stations, technological upgradation and installation and augmentation of online system etc. (MHA, 2023)

- **Catalytic Assistance to Twelve Most Drought-prone States**

A total allocation of Rs. 1,200 crore over the award period (2021-2026) has been done for 12 States that are most drought-prone and have suffered drought on recurrent basis. Madhya Pradesh is also one of the 12 states allocated with Rs. 100 crore that can be utilised to develop long-term drought mitigation plans which would include area-specific farming systems, improvements in surface and ground water management, promoting efficiency of water use, agro-forestry schemes and solar energy installations. The plans are to be developed at drought-affected district level. (Finance Commission, 2020)

Way Forward:

This section presents recommendations to further strengthen the state preparedness for disasters.

Strengthening policies

1. While the State has a State Disaster Management Plan, it was prepared in

2012. Given the changing hazard profile and linkage with climate change, the plan needs to be updated with proper hazard, vulnerability and risk assessment. The Sendai Framework for Disaster Risk Reduction was introduced in 2015 that aims to guide the multi-hazard management of disaster risk in development at all levels as well as within and across all sectors. Taking cue from the National Disaster Management Plan, which adheres to the Sendai framework and has hints and flavours of SDGs, the State DM Plan can be revised and updated accordingly.

Likewise, District Disaster Management Plans of all the districts should be reviewed and updated on a yearly basis by the district authority. To regularise this annual activity, a joint certificate of plan updation can be taken from the district collector and SP.

2. Out of the many hazards affecting the state, lightning is the one causing maximum number of deaths. Given the severity of this hazard, lightning can be considered to be declared as state specific disaster. This will enable the state government to use up to 10% fund of the annual allocation of the SDRF for providing immediate relief to the victims. Intensive amount of awareness is also required at community level to avoid deaths due to lightning. This can be done with the support of panchayats. IMD forecast and apps like 'Damini' & 'Meghdoot' can be useful in mitigating lightning risk. Damini lightning alert application gives warning to the user about the lightning based on user location. Similarly, Meghdoot is mobile application to assist farmers for weather-based farm management. Rigorous

awareness activities and popularisation of such apps is required for the vulnerable population in the state.

3. References to disaster management might be integrated across the disciplines in schools or higher education. But disaster management can be included as a separate subject in academic curriculum of schools and colleges. This will help creating a generation which is more aware towards disasters and climate change challenges. Time to time trainings/mock exercise should be provided at schools and government offices to train people on basics of disaster management and lifesaving skills.
4. Cross learning of good practices from other states would further strengthen the state's disaster risk management. For example, Odisha has integrated disaster management in education curriculum, also government jobs and recruitment have a mandatory syllabus on disaster management. Kerala state DM policy states that disaster resistant design and construction practices and retrofitting techniques shall be made part of University Undergraduate Courses in Civil Engineering and Architecture. Telangana introduced 'Telangana Cool Roof Policy 2023-2028' to address the extreme heat challenge through policy. In 2015 Tamil Nadu was flood affected, people lost their important documents and certificates in floods. Special camps were conducted for two weeks for efficient retrieval of lost documents through single-window.

Leveraging funds for better preparedness and resilience

5. As highlighted in the MPSDR, 2022, the state lacks the implementation of a Fire Safety Act

as mandated by the GoI. The fire services need to be appropriately organized with adequate infrastructure and equipment for keeping pace with the advancement of technology and economic growth. The provisions made under the modernisation of fire services can be leveraged to revamp the fire services in the state for ensuring the safety of life and property.

6. The catalytic assistance provided to the state for development of long-term drought mitigation plans can be prepared with the community participation so that it addresses the needs of the community in drought-prone districts and utilise their knowledge and practices for building drought resilience.

Upgrading resources

7. To develop a robust disaster monitoring infrastructure, the Command and Control Centre at each district need to be strengthened by renovation, equipment and human resource.
8. The organizational setup of MPSDMA consist of seven divisions namely, administrative, operation and coordination, IEC and media, training and capacity building, research and policy development, finance planning and coordination, and international cooperation cum new technology. These divisions cover all the dimensions of an institute concerned for disaster management, but as per the disaster risk and resilience index of India, 2019, the total number of professionals working with SDMA are only three. The capacity of MPSDMA in terms of human resource and infrastructure can be further strengthened.

Conclusion

The disaster risk landscape of the state might not be very strong as compared to other few states. But given the nature of disasters and impact of climate change, the frequency and intensity of hazards has been increasing. Hazards like flooding, extreme weather events, fire incidents have increased in number unlike their occurrence and impact in the past. Covid-19 is another example when compounding events were witnessed. This gives a strong reason to strengthen the preparedness of the state, from community level to institutional level, to effectively deal with any disaster in the future.

Annexure

Annex 1

Hon'ble Prime Minister of India, Mr. Narendra Modi laid down the **10-point agenda for efforts towards disaster risk reduction**, which was delivered at the Asian Ministerial Conference on Disaster Risk Reduction held in New Delhi, in 2016. These points are:

1. All development sectors must imbibe the principles of disaster risk management.
2. Work towards risk coverage for all - starting from poor households to SMEs to multi-national corporations to nation states.
3. Encourage greater involvement and leadership of women in disaster risk management.
4. Invest in risk mapping globally.
5. Leverage technology to enhance the efficiency of disaster risk management efforts.
6. Develop a network of universities to work on disaster issues as they have social responsibilities too.
7. Utilise the opportunities provided by social media and mobile technologies and recognise the potential of social media and develop applications for all aspects of disaster risk management.
8. Build on local capacity and initiative.
9. Ensure that the opportunity to learn from a disaster must not be wasted.
10. Bring about greater cohesion in international response to disasters.

Annex 2

Sendai Framework for Disaster Risk Reduction (SFDRR)

Targets

- Substantially reduce global disaster mortality by 2030, aiming to lower average per 100,000 global mortality between 2020-2030 compared to 2005-2015
- Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 between 2020-2030 compared to 2005-2015
- Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030
- Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030
- Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020

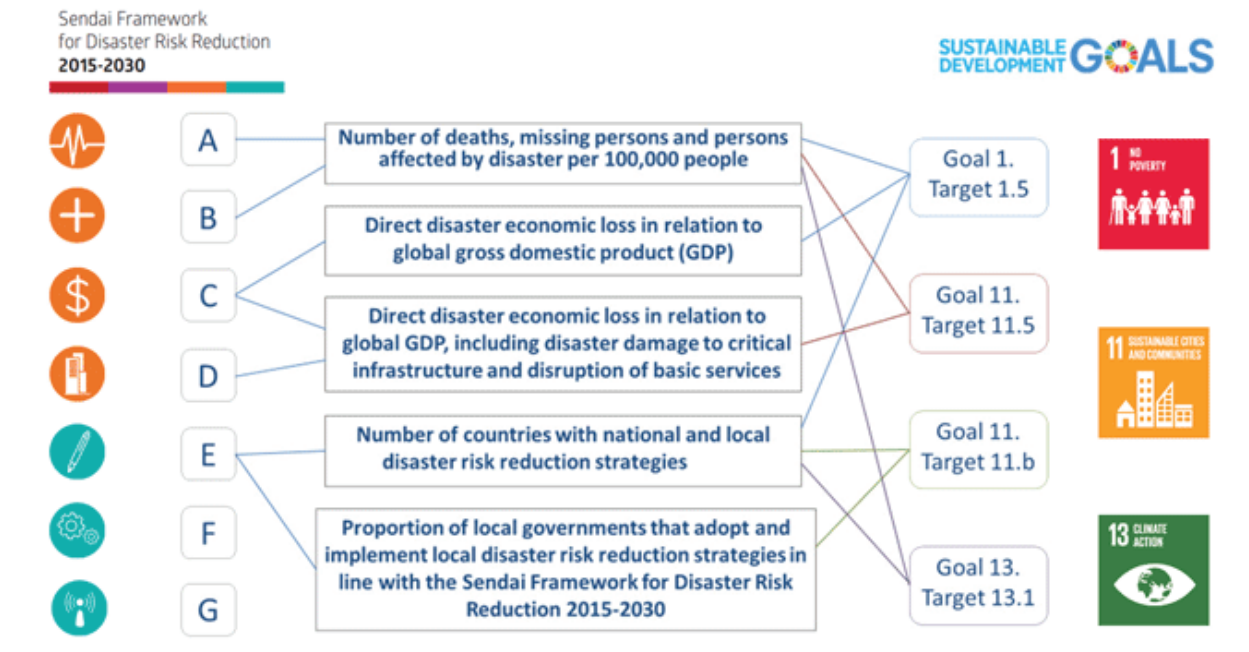
- Substantially enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030
- Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030

Priorities for Action

- Priority 1: Understanding disaster risk
- Priority 2: Strengthening disaster risk governance to manage disaster risk
- Priority 3: Investing in disaster risk reduction for resilience
- Priority 4: Enhancing disaster preparedness for effective response, and to Build Back Better in recovery, rehabilitation and reconstruction

Annex 3

SFDRR linkages with SDGs



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