

JICA Global Agenda for No. 20 Disaster Risk Reduction through Pre-disaster Investment and Build Back Better



Japan International Cooperation Agency (JICA) works toward the achievement of the Sustainable Development Goals (SDGs).

1. Objectives

(1) Objective of the Global Agenda

The Global Agenda for “Disaster Risk Reduction through Pre-disaster Investment and Build Back Better” (GA-DRR) aims to bring about a downward global trend in the number of deaths, affected people, and economic losses due to natural hazards by 2030 with materializing efficient and effective contributions for building the capacity of the disaster risk reduction (DRR) related government organizations to manage, self-finance, maintain, and augment the public pre-disaster investment in DRR in a sustainable manner.

(2) Objectives of Development Scenarios (“Clusters”)

To attain the above objectives of the GA-DRR, JICA will pursue the following three clusters.

1) "Realizing pre-disaster investment for capital concentration centers, especially in mega cities"

This approach aims at enhancing the capacity of DRR related government organizations in charge of structural measures (DRR and critical infrastructures), so that the organizations are capable to maintain, operate and increase the structural measures with their own national budget.

2) "Establishment of DRR institutions for understanding disaster risk and strengthening disaster risk governance"

JICA cooperates to strengthen the all-around disaster risk governance that is equipped with a capacity to plan, and implement a comprehensive DRR policy including non-structural measures in order to promote proactive DRR.

3) "Promoting Build Back Better (BBB)"

In the post-disaster recovery and reconstruction, we have to boost up DRR based on the global definition of “Build Back Better.”

2. Current Situation, Analysis of Issues

(1) Context

DRR is directly linked to “Human Security” since it helps saving human lives and extricates the socio-economically vulnerable people that are more likely to be exposed to hazards from the vicious spiral of poverty. And, DRR is also essential for “Sustainable Development.” since it enables sustainable urban and human settlements and mitigating climate change impacts. As developing countries continue to develop rapidly, disaster risks are further increasing due to urbanization, globalization, and climate change impacts, creating more needs for DRR. If efforts in DRR are delayed amid the threat of COVID-19, the human and economic losses due to natural hazards will increase.

Hazards are, however, natural phenomenon, and it is unpredictable in terms of time and magnitude. A larger hazard can take place unexpectedly than human beings have anticipated. Also, it is difficult to visualize the effect of investment in DRR precisely. Therefore, each government tends to put DRR issue on the back burner among other national policies and agendas. Having illustrated so far, DRR is a challenging agenda. The Sendai Framework for Disaster Risk Reduction (SFDRR) was adopted at the Third United Nations World Conference on Disaster Risk Reduction in March 2015 while going through the experience from the unprecedented 2011 Great East Japan Earthquake. SFDRR has achieved international recognition of important concepts such as pre-disaster investment in DRR and BBB as a result of a series of the discussion led by the Japanese Government negotiation members with a strong leadership based upon Japan's experience in DRR. Before the adoption of the SFDRR, the international society has put its priority on responsive actions and humanitarian reliefs; however, the SFDRR has caused a paradigm shift that DRR is not the humanitarian issue but the core development issue. The SFDRR was agreed by the UN member states in March 2015, prior to the SDGs and the Paris Agreement. As shown in the fact that several SDGs targets have identical indicators with SFDRR¹, it is obvious that sustainable development and climate change adaptation cannot be attained without DRR.

(2) Challenge

【Increasing Disaster Risks in Developing Countries】 : Rainfall increase due to global warming has become a clear trend in recent years. Notably, the frequency of heavy rain, where rainfall abnormally concentrates geographically for a short period, has been on the rise globally. Such a trend increases the severity and likelihood of the losses caused by floods and landslides. According to the Paris Agreement target scenario (RCP2.6)², it is estimated that the frequency of floods in Japan will be double by 2040, compared to the end of the 20th century. We observe many developing countries experiencing rapid but unplanned urbanizations. The population and asset concentration in urban areas are increasing disaster risks at the same time. Further, cross-border economic activities and supply chain expansions are also increasing the global disaster risks.

【Progress and Gaps in SFDRR Global Targets】 : The SFDRR has set four global targets (GT) at the outcome level as shown in Table 1 (GT a: number of mortalities, GT b: number of affected people, GT c: economic losses, GT d: damages to critical infrastructures due to hazards³). As shown in Table 2 (also refer to Graph 1 in the Appendix), in recent years, the human casualties (GT a and GT b) have been decreasing, while economic losses (GT c) have been on the rise. To accelerate the efforts toward achieving the GTs, the reduction of economic losses becomes critical.

¹ 1.5 (Build the resilience of the poor and those in vulnerable situations), 9.1 (Resilient infrastructure), 11.5 (Significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses), 13.1 (Strengthen resilience and adaptive capacity to climate related hazards and natural disasters) etc.

² A scenario that limits the increase in global average surface temperature to 2°C at the end of the 21st century compared to pre-industrial times

³ Critical infrastructure and basic services including health and education facilities

【Table 1】 Target of SFDRR (Global target)

		World	Developing country	Developed Country and China
Population		7.51 billion people	4.84 billion people	2.67 billion
Human casualties	Average number of mortalities per year (2005-2017)	74,000 people	565,000 people	175,000 people
	GTa (per 100,000 people)	0.99	1.17	0.66
	Average number of affected people per year (2005-2017)	189 million people	0.97 billion people	0.92 million people
	GTb (per 100,000 people)	2,520 people	1,999 people	3,464 people
GDP		9,393 trillion yen	1,876 trillion yen	7,517 trillion yen
Economic damage	Economic losses (2005-2017)	16.9 trillion yen	3.7 trillion yen	13.3 trillion yen
	GTc (Ratio against GDP)	0.180%	0.197%	0.176%

【Table 2】 Increasing or decreasing trend of global target (1994 - 2019)

	GTa (Number of mortalities: 1994-2019)	GTb (Number of affected people: 1994-2019)	GTc (Economic losses: 1994-2019)
World	Decrease (-5,529 people per year)	Decrease (-4,333 thousand people per year)	Increase (+489.5 billion yen per year)
Developing country	Decrease (-5,447 people per year)	Increase (+1,078 thousand people per year)	Increase (+135.5 billion yen per year)
Developed Country and China	Decrease (-82 people per year)	Decrease (-5,411 thousand people per year)	Increase (+354.0 billion yen per year)

(3) Japan's Comparative Advantage among Development Partners

Over centuries, Japan has progressively tackled DRR as public investment to address the fundamental DRR. This approach is based upon Japan's history and knowledge of DRR. These traits serve as Japan's strength and comparative advantage with the other bilateral and multilateral development partners. Hence, JICA exhibits leadership in DRR globally with the GA-DRR.

(4) Policy Focus of the Government of Japan

The GA-DRR focuses primarily on reducing economic losses, and such emphasis also interrelates with several important strategic policies of the Government of Japan. Japan's Official Development Assistance ultimately promotes human security. To achieve the concept of human security, structural measures through public investment (prevention of flood and landslide, quake-resistant construction of critical infrastructure etc.) are important actions to minimize initial shocks to vulnerable marginalized groups. In addition, advancing DRR infrastructure and resilient critical infrastructure directly contributes to the G20 principle of the Resilient Infrastructure and Quality Infrastructure. The GA-DRR considers the medium- to long-term effect of climate change, pursuing a coherence between DRR and climate change adaptation. The GA-DRR draws knowledge uniquely evolved in Japan such as a comprehensive approach to minimize

residual risks, which cannot be eliminated by structural measures, while combining with non-structural measures exemplified as mobilizing flood control capacity of multi-purpose dam.

Lastly, the GA-DRR plays an instrumental role in strengthening the ties between Japan and the Indo-Pacific region. This region is exposed to flood, earthquake, monsoon related disaster and landslide, as with Japan. It is important to provide assistance in this region to enhance the linkage over countries. This challenge is accorded with the Free and Open Indo Pacific initiative (FOIP), that is one of the most important diplomatic policies in the Government of Japan.

3. Significance of Japan and JICA's Engagement

(1) Rationale

Japan has faced disasters frequently experiencing almost all of hazard types that happen globally. Over the centuries, Japan has developed effective and creative measures while making the most use of traditional wisdom and experiences in DRR. The Shingen Dike⁴ by Shingen Takeda in the 16th century is an example. Another instance is the Tone River improvement project by the Edo Shogunate Government in the 17th century. These are the examples of Japan's historical flood control practices. Likewise, there is experience and knowledge of tsunami in society. The country's expertise has been accumulated based on the value in which we should not repeat the same loss after every disaster. Japan's technologies, governance/policies, and wisdom in DRR are highly practical, insightful and valuable for developing countries that pursue rapid economic growth with DRR at the same time since such knowledge is actually derived from Japan's own past lessons and accumulated knowledge. To realize economic growth and human security in developing countries through JICA's DRR cooperation programs can be taken as Japan's duty.

JICA's cooperation in DRR contributes to building trust and respect in the international society, directly linking to the JICA's vision "leading the world with trust". Enhancing solidarity across the borders is increasingly critical, particularly in the countries in the Western Pacific region. This region has similarities in geography, topography, and natural conditions. Also, this region requires to enhance the solidarity in terms of strong economic tie and supply chain as well as regional disaster events. Overall, it is important for JICA to provide assistance to contribute to the solidarity.

(2) Sendai Cooperation Initiative for Disaster Risk Reduction

The Government of Japan has set specific quantitative targets to be achieved in the two phases of the "Sendai Cooperation Initiative for Disaster Risk Reduction" (2015-2019

⁴ To weaken the flow of the river, the river channel was changed and a spur dyke was built in the river. Also, more than 1,800 m of levees were built downstream of the confluence of the Kamanashi and Midai Rivers.

and 2020-2024)⁵. JICA steadily contributed to develop human resource, totaling 4 billion USD and 40,000 trainees during a period of 2015 and 2018.

4. Scenarios Contributing to Objectives of the Global Agenda, and Clusters

(1) Basic Principles and Approach of the Global Agenda

The GA-DRR will focus on promoting pre-disaster investment in DRR, with emphasis on reducing economic losses, which are on the rise, considering efficient and effective contributions to the SFDRR GTs (GT a: number of mortalities, GT b: number of affected people, GT c: economic losses, GT d: damages to critical infrastructures due to hazards).

(2) Needs for pre-disaster investment in DRR

The DRR sector requires cross-sectoral efforts not only in infrastructure but also in education, health, and other areas, making it difficult to grasp the actual amount of investment in DRR in each of these areas. However, flood control investment is exceptionally specified for DRR, and therefore, it is possible to grasp the actual amount of investment in DRR to some extent even in developing countries⁶. For example, Japan, which has historically invested more in flood control during its rapid economic growth period, is still investing US\$13.1 billion (about JPY1.45 trillion, 0.298% of GDP) compared to an average economic loss of about US\$22 billion (JPY2.4 trillion, 0.445% of GDP) during 2005-2017 (about 60% of damage).

On the other hand, the current level of investment in flood control in developing countries is extremely low⁷, and many countries have not invested even half of the current damage amount in flood control. Considering the insufficient pre-disaster investment accumulation in DRR, beyond the current level 60% in Japan, 80% of the estimated total amount of damage is set as the minimum target amount of investment in disaster prevention, and the total amount of pre-disaster investment in DRR is estimated to be at least \$26.74 billion (JPY2.95 trillion, 0.157% of GDP) per year for all developing countries⁸⁹.

⁵ Assistance to at least 5 million people, human resource development and disaster prevention education for 85,000 people, and support for the formulation and revision of disaster prevention plans in 80 countries.

⁶ However, in many countries, flood control and irrigation are often under the jurisdiction of the same ministry, and in most cases, these budget expenditures are combined in the statistics, so it is often difficult to grasp the amount spent only for flood control.

⁷ Philippines is an exception, investing 0.345% of GDP (more than 70% of the total damage) in flood control.

⁸ Although this figure should be achieved by investment in flood control only, it is considered here as a minimum target that should be achieved by including investment in disaster prevention for other types of disasters also. Ishiwatari et al. (2020) "Bridging the Gaps in Infrastructure Investment for Flood Protection in Asia (JICA-RI WP.202)" indicate that 0.24% of GDP is the current investment level.

⁹ Based on the World Risk Index, the natural increase in risk capital for developing countries as a whole is estimated to be about 1 trillion yen per year.

【Table 3,4】 Pre-disaster investment in DRR in developing countries

	2018GDP (billion USD)	Economic loss (Average of calendar year) (billion USD)	Ratio to 2018GDP	Investment in flood control 2015 (billion USD)	Ratio to 2015GDP	Ratio to 2015 national budget	Investment in DRR / Damage
Japan (Reference)	4,954.8	22.05	0.445%	13.09 (annual average)	0.298%	1.737%	59.4%
Bangladesh	274.0	0.62	0.226%	0.007	0.004%	0.040%	1.1%
India	2,713.2	4.34	0.160%	1.50	0.065%	0.471%	34.6%
Indonesia	1,042.2	1.02	0.097%	0.5	0.054%	0.401%	49.2%
Philippines	346.8	1.51	0.436%	1.10	0.345%	2.664%	72.7%

	2018GDP	Economic loss (average in 2005-2017)	Target amount of investment in DRR (80% of economic damage)	Ratio of target amount to GDP
Total of all developing countries	169,991.4 billion USD (1,876 trillion yen)	33.43 billion USD (3.7 trillion yen)	26.74 billion USD (2.95 trillion yen)	0.157%

【Typology of pre-disaster investment and measures for DRR】

Depending on hazard types, applicable pre-disaster investment for DRR will vary as shown in Table 5. The GA-DRR focuses on climate-related hazards such as floods, typhoons/windstorms, storm surges and other hazards including earthquakes, tsunamis, volcanic eruptions, and riverbank/coastal erosion¹⁰. In addition, cluster (1) targets DRR infrastructure and critical infrastructure, which are shaded below.

【Table 5】 Types of pre-disaster investment in DRR and responsible organizations

Hazard controllability	Hazard type	Measures of pre-disaster investment	Responsible organization
High	Flood, Landslide, Storm surge etc.	●DRR infrastructure DRR infrastructure to reduce hazard exposure of flood, sediment and coastal disasters etc.	Main: line ministry in charge of flood control / sediment and coastal disaster
		●Critical infrastructure Lifeline such as transportation, power, water, telecommunications, and education and health facilities	Main: line ministries in charge of critical infrastructure, local government Sub: DRR organization
		●Non-structural measure Strengthening disaster risk governance, land use regulation and management, forecast and warning, understand disaster risk	Main: line ministry in charge of flood control / sediment disaster, DRR organization, meteorological line ministry, local government etc.
Low	Earthquake, volcanic eruption, Storm etc.	●Critical infrastructure Lifeline such as Transportation, power, water, telecommunications, education, and health	Main: Line ministries in charge of infrastructure, local government Sub: DRR organization
		●Privately-owned assets House, Privately-owned building (Hotel, shopping mall, Logistics and production center)	Main: DRR organization, local government, line ministry in charge of building, ministry of Finance etc.
		●Non-structural measure Strength disaster risk governance, land use regulation and management, forecast and warning, understand disaster risk, revision of building standards, subsidy for earthquake resistance	Main: DRR organization, local government, line ministry in charge of building etc.

¹⁰ The drought will be addressed mainly by clusters in the agricultural and environmental sectors, and will also be collaborated with the GA-DRR.

Floods, storms, and earthquakes are the natural hazards that cause the most economic losses in developing countries, in that order, and it is extremely important to effectively invest in DRR against these types of disasters in order to reduce economic losses (refer to Graph 2 in the Appendix).

(3) Major Approaches and Composition of the "JICA Cluster"

1) Overall goals necessary to achieve the objectives in the GA-DRR

To achieve the downward trend in the number of those who die and are injured as well as the economic losses by 2030, we estimate the total amount of pre-disaster investment in DRR to be offered for developing countries is more than 80% of total losses they received in 2018, which is equivalent to 26.74 billion USD (2.95 trillion JPY or 0.157% of developing countries' total GDP per year at 2018 GDP level).

2) Priority regions (countries) and cooperation directions by region

In order to maximize our contribution to the global target in the SFDRR, JICA puts its focus on the Southeastern Asia and Pacific, the South Asia, and the Latin and South America regions whose impacts in the indicators GTa (number of mortalities), GTb (number of affected people) and GTc (economic losses) are high.

3) Expected budget amount level

For the time being, JICA maintains the recent level of the operation (See Appendix Table 1 for more detail information)

4) JICA cluster

The Global Agenda includes the following three mutual and close complementary clusters, covering structural (hard) and non-structural (soft) measures (See Appendix Figure 1).

i. Realizing pre-disaster investment for capital concentration centers, especially in mega cities.

a. Abstract

JICA tries to embody model projects of pre-disaster investment, which are regarded as high-priority with expectation for high benefits, to disseminate the rationale and philosophy of DRR in each country. Moreover, JICA strengthens the capacity of organizations in charge of DRR infrastructures and/or critical infrastructures to increase pre-disaster investment in DRR securing their own national budget in a sustainable manner. Figure 2 in the Appendix shows examples of JICA's past cooperation.

b. Target

By 2030, JICA cooperates with 10 organizations¹¹ in charge of DRR infrastructures (e.g., line ministry in charge of flood control / sediment disaster) or critical infrastructures (e.g., line ministries in charge of infrastructure) that are equipped with sufficient capacities to increase pre-disaster investment in DRR with their own national budget in a sustainable manner.

¹¹ At present, there are 54 organizations responsible for DRR infrastructure and critical infrastructure that have cooperated with JICA, of which 27 organizations are designated as priority for cooperation.

c. Key Cooperation Areas

- To improve the capacity to formulate a comprehensive master plan for each river basin and metropolitan area that helps to reduce disaster risk due to specific hazards (e.g., flood, landslide, earthquake) systematically and multidisciplinary;
- To enhance the capacity of designing structural measures and analyzing feasibility of every single project;
- To realize model projects of pre-disaster investment in DRR and;
- To implement ODA loans and grants projects:
 - To reduce disaster risk of urbanized areas where population and economic capital are concentrated also taking into account the fact that these areas are likely to bring a higher investment effect in the future because disaster impacts are likely to get intensive and frequent due to climate change.
 - To realize structural measures that can surely reduce disaster risk in terms of casualty and economic loss since many developing countries have not developed even the fundamental structural measures e.g. for the frequent flood that can take place annually.
 - To embody the rationale and philosophy of DRR that should be pursued in the country.

ii. Establishment of DRR institutions for understanding disaster risk and strengthening disaster risk governance

a. Abstract

To cooperate for strengthening overall DRR governance system in a country capable to autonomously improve the capacity in planning and implementing comprehensive DRR measures with strongly committed human resources and sufficient operational budget and authority.

b. Target

JICA cooperates with 20 DRR related organizations ¹² (including meteorological agencies etc.) to establish their sufficient capacity by 2030. JICA aims to expand the overall DRR governance system in a country by performing JICA projects, thereafter autonomously improving the national capacity in planning and implementation of comprehensive DRR measures.

c. Key Cooperation Areas

- Strengthening the capacity of the government to observe/monitor and identify disaster risk for each natural hazard;
- Developing basic infrastructure for understanding and managing disaster risk (enhancement of observation system in weather and earthquake and of early warning system, construction of DRR agency buildings etc.);
- Formulating DRR strategy/plan by improving comprehensive planning functions in securing necessary actions and budget to promote DRR
- Improving coordination function regarding DRR among line ministries, between central and local governments, and within local governments and;
- Taking non-structural measures to address residual risks that cannot be eliminated by structural measures in advance

¹² At present, there are 88 organizations that have cooperated in disaster prevention promotion, of which 32 are designated as priority organizations for cooperation of JICA

iii. Promoting Build Back Better (BBB)

a. Abstract

In order to achieve DRR in a nation and/or society on a post disaster reconstruction process, JICA embodies measures to fundamentally reduce disaster risk particularly with structural measures, thereafter lowering the susceptibility and vulnerability to make the nation/society more resilient by disseminating and penetrating the concept of DRR that should be pursued in the country.

b. Target

In the event of a large-scale disaster, JICA provides emergency assistance and seamlessly transits to reconstruction phases. In addition, JICA does not only disseminate and penetrate the rationale and philosophy of DRR through materializing recovery process with real effective DRR investment, but also aims to stimulate other donors, private sectors and NGOs to be engaged in more effective DRR projects in the reconstruction phase.

c. Key Cooperation Areas

- Reconstruction planning based on the international definition of Build Back Better;
- Reconstruction with improvement of DRR infrastructure and critical infrastructures damaged by disasters;
- Development of DRR infrastructure and critical infrastructures which have not sufficiently been developed to date.
- Other efforts to minimize the vulnerabilities latent in a nation, society and community with aiming at enhancing collaborative works within JICA to strengthen the resiliency and to reduce the vulnerability to various types of threats. To do so, JICA's relevant departments and groups challenge collectively, dynamically and multidisciplinary as much as possible, such as poverty alleviation and mainstreaming gender.

5) Priority relationships between the clusters

JICA distinguishes Cluster 1 from Cluster 2 in the Global Agenda in terms of priority. JICA puts main priority to Cluster 1. Cluster 1 focuses on structural measures against disaster risks due to low intensive and high frequent hazards"¹³. Even in a country where efforts in structural measures have been primitively less, JICA does not focus only on non-structural measures which developing countries are likely to prefer as an easier and less expensive approach. Again JICA emphasizes the importance to achieve reducing disaster risk fundamentally in order to ensure human security and sustainable development, promoting steadily DRR for a medium-to-long term basis. In addition, Cluster 2 focuses on enhancing DRR governance system while including non-structural measures. JICA takes Cluster 2 in a country where structural measures have been taken to sufficient extents (See the Figure 3). Moreover, JICA takes Cluster 3 in a reconstruction phase of a country where hit

¹³ Extensive Risk, which the UNDRR defines as "low-severity, high-frequency hazardous events and disasters, mainly but not exclusively associated with highly localized hazards." This is a hazard that has a probability of occurrence greater than that specified by the country as a target for structural measures (e.g., floods that occur with a frequency greater than the 30-year probability).

by severe disasters despite efforts in pre-disaster investment. Cluster 3 utilize the reconstruction opportunity to promote Cluster 1 and 2.

(4) Cross-sectoral approach = Mainstreaming DRR

a. Abstract

“Mainstreaming DRR” means “bringing a DRR perspective to all sectors of development and increasing budgets necessary for pre-disaster investments”. It is important to incorporate a DRR perspective into such sectors as transportation, power, water, telecommunications, education, and health. JICA aims to take actions based on a correct understanding of disaster risk.

b. Approach

To promote and ensure development based on disaster risk understanding, JICA promotes cooperation to disseminate and provide disaster risk information (hazard maps, etc.) by utilizing Digital Transformation (DX) etc. And, to incorporate a DRR perspective into the Urban and Regional Development and the Transportation sectors in particular, GA-DRR is enhancing the collaboration with those clusters. In addition, JICA aims at building a system to take DRR into consideration in a project formulation process in the urban planning and infrastructure by revising the Guidelines for Environmental and Social Considerations, thereafter making it possible to consider alternatives and/or disaster risk on the project formulation process.

5. Strategic Approaches for the Global Agenda and Clusters

(1) Utilization of ODA loans and grants

As for ODA loans and grants schemes as direct contributions, JICA selectively implements symbolic projects that can disseminate the rationale and philosophy of DRR that should be pursued in a country taking into account the DRR capacity of the counterpart. JICA uses the Grant Aid scheme to exemplify basic flood control measures (including inland flood control) in Africa as well as the diffusion of the dual polarization radar to strategically introduce to developing countries. Not just relying on ODA loans and grants, JICA seeks any possibility to mobilize recipient countries’ self-effort to allocate own national budget and to urge private sectors and individuals for DRR investments for their own assets. Furthermore, the use of PFI (Private Finance Initiative) can be considered¹⁴. For privately-owned assets, systems and measures to incentivize pre-disaster investment in DRR could be introduced to reduce the external impact by the disaster to the society as a whole by, for instance, combining subsidies for earthquake reinforcement and insurance.

¹⁴ In Japan, for example, there are PFI plans that combine super levees with real estate development.

(2) Cooperation with development graduate institute and utilization of Japan's experience

Human resource development is extremely important because this Cluster aims at promoting and disseminating the rationale of DRR and at maintaining and increasing pre-disaster investment in DRR as a part of public works in a self-sustaining manner. This highlights the importance of enhancing human capacity in DRR. Also, it is also highly significant for recipient government to understand Japan's challenges in the past such as the Edo and Meiji eras as well as contemporary times experiencing a rapid economic growth. During these periods, Japan achieved a highly balanced level of economic development and DRR. Following efforts will be strengthened.

- The JICA Scholarship Program "Development of Core Human Resources for Disaster Risk Reduction Contributing to the SFDRR": JICA annually receives up to five students at Tohoku University or the National Graduate Institute for Policy Studies from 2018, thus continuing to develop human resources to develop global DRR leaders who are familiar with Japan's knowledge and know-hows. JICA also enhances collaboration networks with Japan's top academicians that can also work for projects on the ground.
- JICA works closely with human resources in both public and private sectors (ministries, consultancy firms, civil engineering construction companies, etc.) that possess Japan's DRR technology. JICA also utilizes frameworks such as the Japan Bosai Platform (JBP) and the Japan International Public-Private Association for Disaster Risk Reduction (JIPAD).

(3) Utilization of DX and innovation

- The Cabinet Office takes an initiative in the Cross-ministerial Strategic Innovation Promotion Program, by which "Strengthening a national resilience (disaster prevention and mitigation)" is placed as one of the main issues; and the program aims at realize the "Society 5.0 in times of disaster" to effectively function at the times of disasters that are likely to become intensive due to climate change while utilizing satellites, big data, AI etc. at each phase, including prediction, prevention and response.
- JICA aggressively makes use of innovative technologies such as the Data Integration and Analysis System (DIAS) for forecasting climate variations as well as identifications of disaster risk and disaster damage and application to recovery plan by means of satellite imagery and drones as a part of the Sentinel Asia and other systems.

(4) Contribution to Japanese Society and Economy

- Contribution to Japan's economic activities (DRR through private companies which extend overseas business and supply chains etc.). A typical example is the project on regional resilience enhancement through establishment of Area-Business Continuity Management (BCM) at industry complexes in Thailand.
- Contribution to private companies which sell products made in Japan, construct or export high-quality infrastructure including through ODA loans and grants, and

private partnerships

- Contribution to reimport of DRR technologies evolved overseas (e.g., sediment control).
- Contribute to disaster recovery as well as rural revitalization by disseminating the philosophy of new initiatives such as SDG Future City initiative.

6. Other Considerations

(1) Matters that require attention

Cooperation for enhancing disaster risk understanding or for taking responsive actions after a disaster should be complementary inputs with primary pre-disaster investments in structural DRR measures. These non-structural measures need to be limited to deal with residual risks that cannot be reduced with the primary structural measures. Even after a disaster, the Cluster 3 emphasizes the importance of Build Back Better to reduce disaster risk through reconstruction process, rather than just ending up with the emergency response and humanitarian aids.

(2) Relationship to other global agendas

To realize sustainable development, it is critical to reduce vulnerability at the national, social, household and individual levels; and JICA extends cooperation in DRR and Reconstructions by collaborating with other Global Agendas including gender, health, education and nutrition while taking into consideration not only physical but also economic, social, political, environmental, and cultural perspectives. Moreover, JICA promotes measures using scientific knowledge on climate change impact projection, and also take considerations on Eco-based DRR and Nature-based Solution (NbS) to harmonize with environment. In particular, the Cluster 3 aims at promoting a dynamic approach across multiple sectors and schemes as much as possible.

(3) Response to COVID-19

1) Contribute to the realization of safe access to healthcare (short, medium and long term)

To strengthen the resilience of medical centers and ensure a safe access, JICA tries to grasp precisely natural hazard (flood, landslide, and earthquake) and contributes to develop resilient medical centers such as hospitals and health centers by providing systemic risk information of natural hazards and pandemics such as COVID-19 and other infectious disease such as cholera.

2) Provision of corona response equipment and materials, and promotion of hand washing through disaster/crisis management organizations (short-term)

In many developing countries, central DRR organizations routinely conduct community-based disaster management activities, such as disaster awareness campaigns and evacuation drill; and community people also play a key role in responding to infectious diseases such as the recent COVID-19 as a part of

crisis management. In countries where JICA provides technical assistance for strengthening disaster risk governance, JICA executes projects by providing education program about preventive actions such as washing hand and gargling campaign to raise their awareness; sharing knowledge about responsive actions and; providing materials such as face covering. At that time, JICA makes use of the network which the central DRR organizations has formed. Through these cooperation, JICA is eager to make a contribution for the central DRR organizations to maintain and increase their status.

3) Promotion of Comprehensive Risk Reduction" (mid- to long-term)

In response to the COVID-19, the international society is likely to accelerate integrating natural hazard with infectious diseases. To effectively connect these challenge with the concept of Build Back Better in social and economic system that is resilient and inclusive, it is necessary to establish a resilient social system that can appropriately manage societal, economic, and institutional vulnerability and respond to external threats such as infectious diseases as well as natural hazards. Because of this, JICA tries to extract essences in terms of social system that can respond to systemic risks based on past lessons from the COVID-19 by means of project research or data collection survey. In extracting the lessons, JICA aims to visualize the systemic and complex risk with DX including satellite technology.

Moreover, JICA does not focus only on identifying prioritized regions for flood protection, but also promote multi-sectoral approach at the designated regions by collaborating with other sectors such as financial inclusion, poverty alleviation, health and hygiene, education, governance and infrastructure.

Appendix:

- Chart 1: "Trend of human and economic damage caused by disasters" (1994-2019)
- Chart 2: "Damage by hazard in developing countries" (1994-2019)
- Figure 1: "Figure of relationship between clusters"
- Figure 2: "Cooperation Examples"
- Figure 3: "Approaches according to Disaster Risk Reduction (DRR) phases"
- Table 1: "Cooperative Approach and Resource Allocation"

**Chart 1 : “Trend of human and economic damage caused by disasters” (1994-2019)
(Created based on EM-DAT data)**

Regarding the current global status of human and economic damage caused by disasters, only economic damage is on the rise, but the number of human damage and affected people is on the decline.

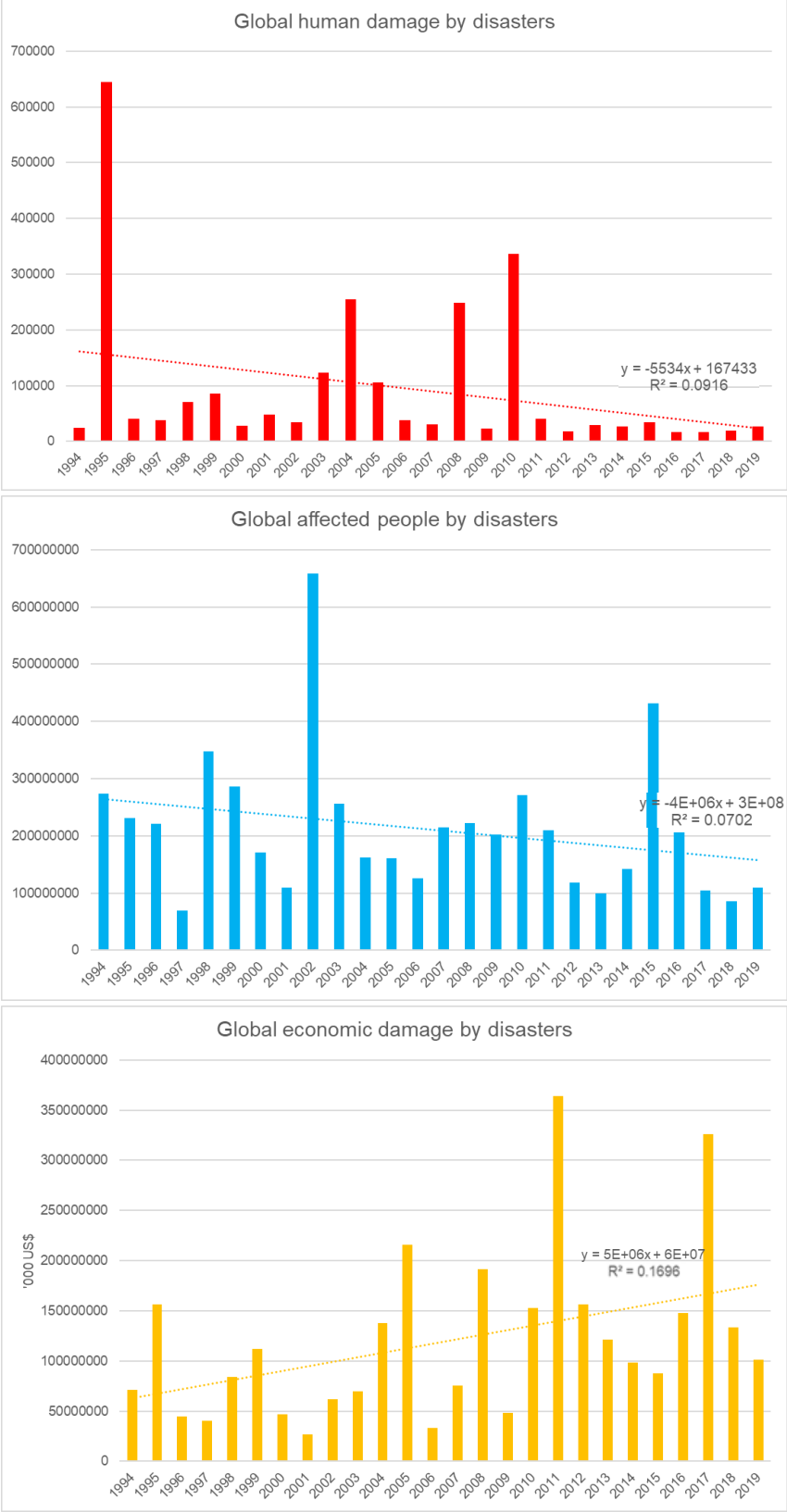


Chart 2: Damage by hazard in developing countries (1994-2019) (Created based on EM-DAT data)

Regarding damage by hazard in developing countries, floods, storms, and earthquakes account for most (about 90%) of the economic losses, which are the biggest challenge.

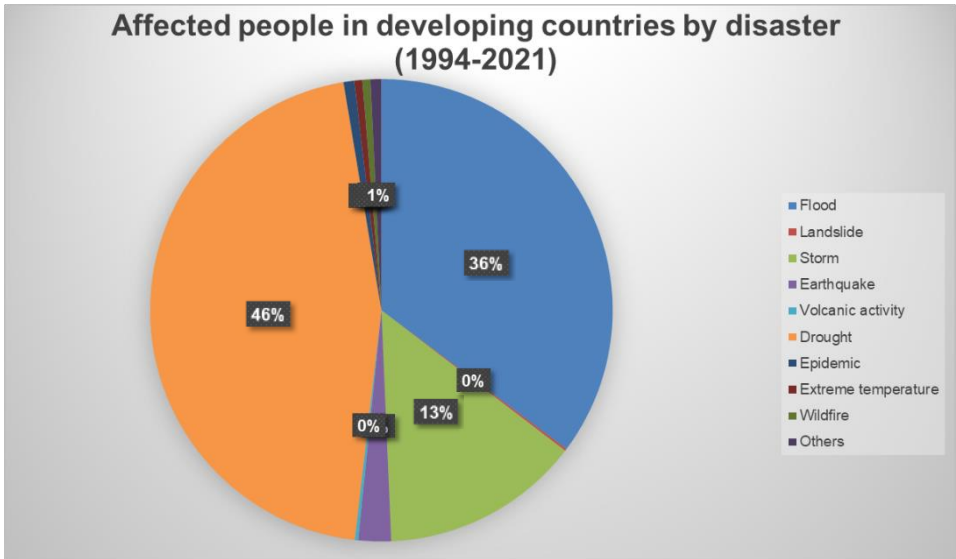
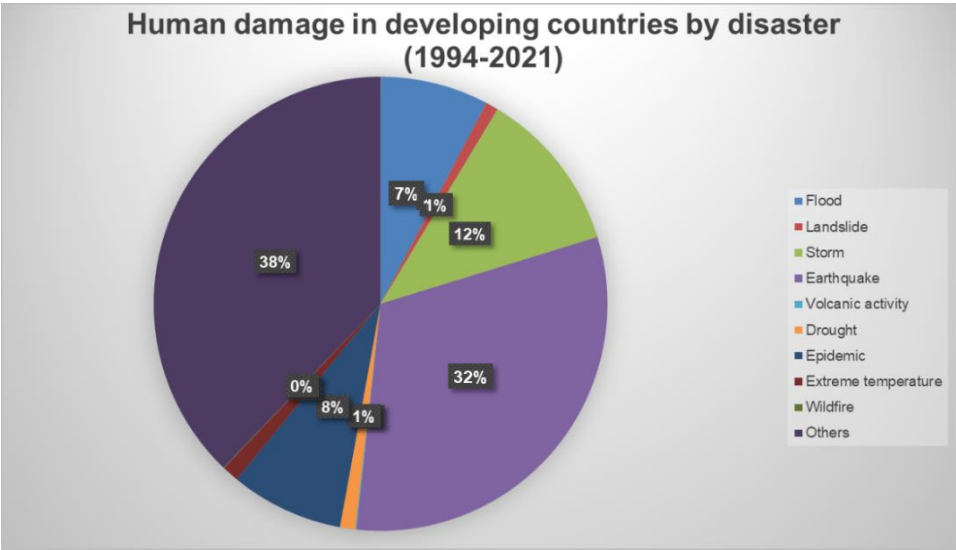
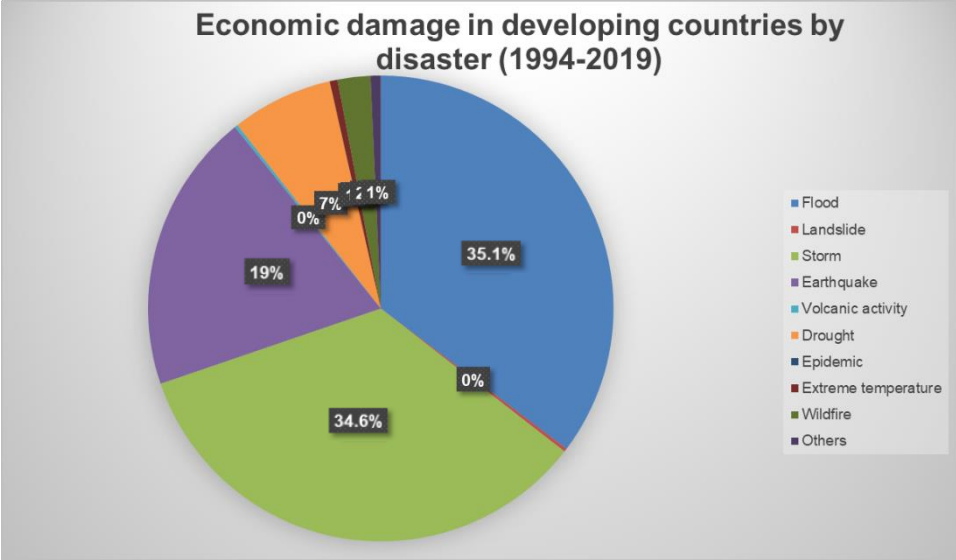


Figure 1: Figure of relationship between clusters

Cluster (1) targets organizations responsible for DRR infrastructure and critical infrastructure (structural measures (hard)), and Cluster (2) targets organizations that promote all-round DRR with the capacity to plan and implement comprehensive DRR measures, including non-structural measures (soft).

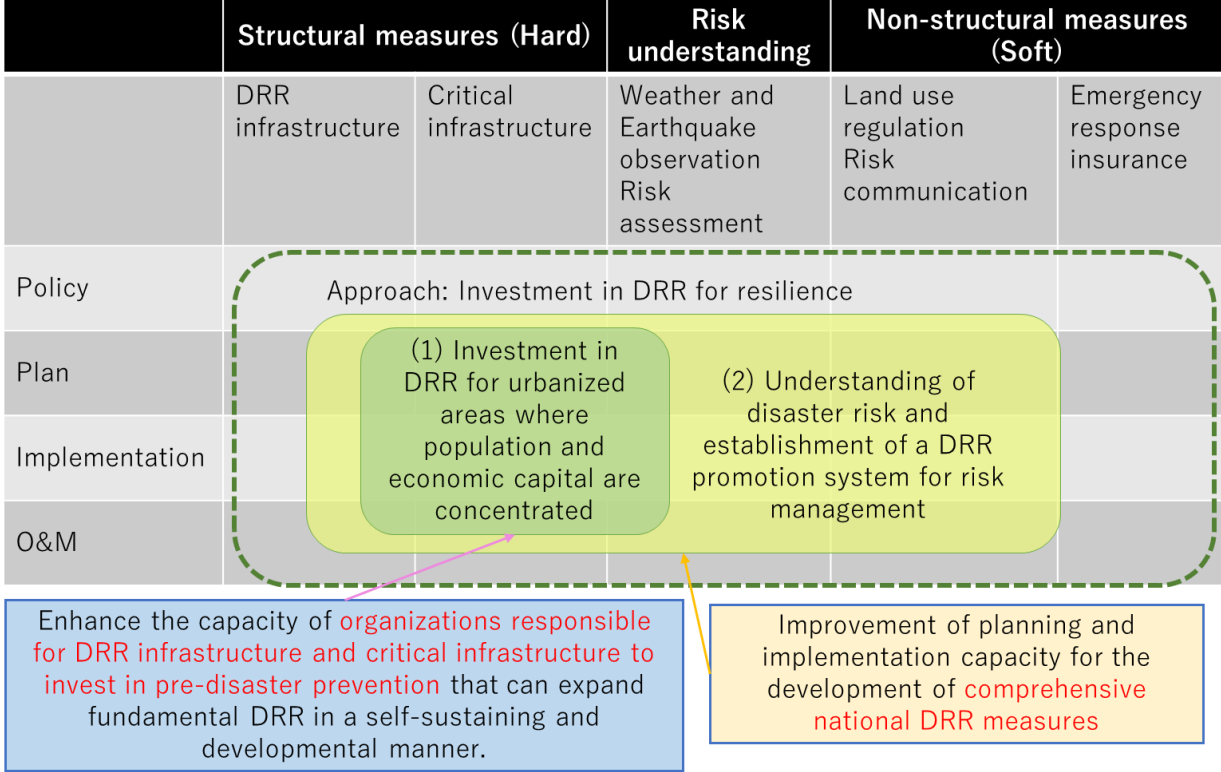


Figure 2: Cooperation Examples

Cooperation examples	
Initiative (1): Investment in disaster prevention for urbanized areas where population and economic capital are concentrated	
<p>1. Enhance the capacity of disaster management institutions</p>	<ul style="list-style-type: none"> Philippines is the sole developing country with a specialized department for flood control, and JICA has continuously supported its establishment and capacity building since 2000 by dispatching experienced Japanese flood control administrators and providing training in Japan. This has enabled Philippines to lead a certain level of flood control measures in the country.
<p>2. Pre-disaster investment in DRR</p>	<ul style="list-style-type: none"> Support for flood control in Metro Manila <ul style="list-style-type: none"> The Pasig Marikina River runs through the area and causes flood. Significant economic and social impact throughout the Philippines. JICA supports the development of a master plan, a spillway construction project, and a river rehabilitation project for the river. In 2009, Typhoon Ondoy/Pepeng caused flooding. More than 600 people were killed in the upstream areas that had not yet been developed, but no serious damage occurred in the central part of Manila, which had been developed through JICA support. Contributed to the prevention and mitigation of damage. JICA has been supporting flood control measures throughout the Philippines since the 1970s through technical and financial cooperation. JICA has assisted in the planning of 10 of the 18 major rivers in the country. The Philippine government understands the importance of flood control and has increased its flood control budget more than 10-fold between 2011 and 2018. JICA is continuing to provide assistance for flood control planning and implementation considering the effects of climate change, and Philippines is one of the priority countries to be targeted for assistance related to flood control.

JICA's Major Support for Flood Control in Metro Manila

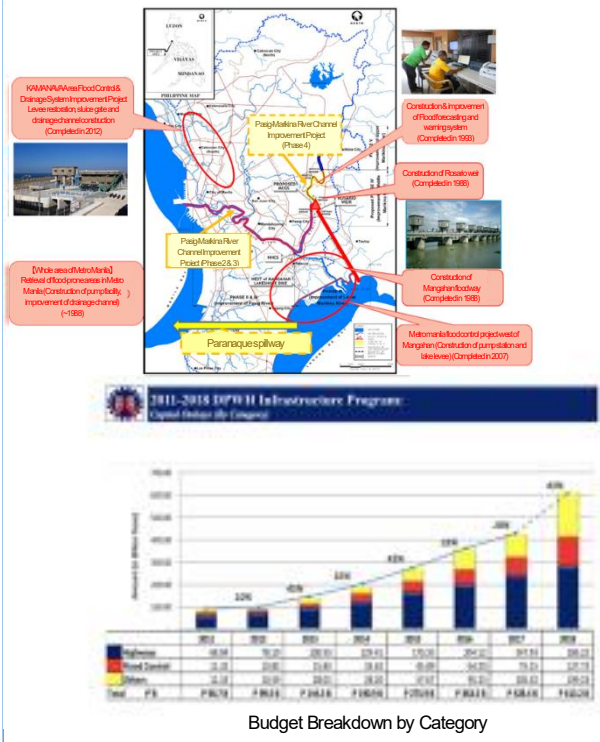


Figure 3: Approaches according to Disaster Risk Reduction (DRR) phases

In the Low DRR and Middle DRR phases, the structural countermeasures in Cluster (1) will be given the highest priority to reduce the fundamental risk of high frequency disasters, and Cluster (2) will also be addressed as a practical next-best measure to reduce the existing disaster risks. In the high DRR phase, when the needs for structural countermeasures have already been met, an all-round DRR system should be established, including the expansion of non-structural countermeasures through Cluster 2.

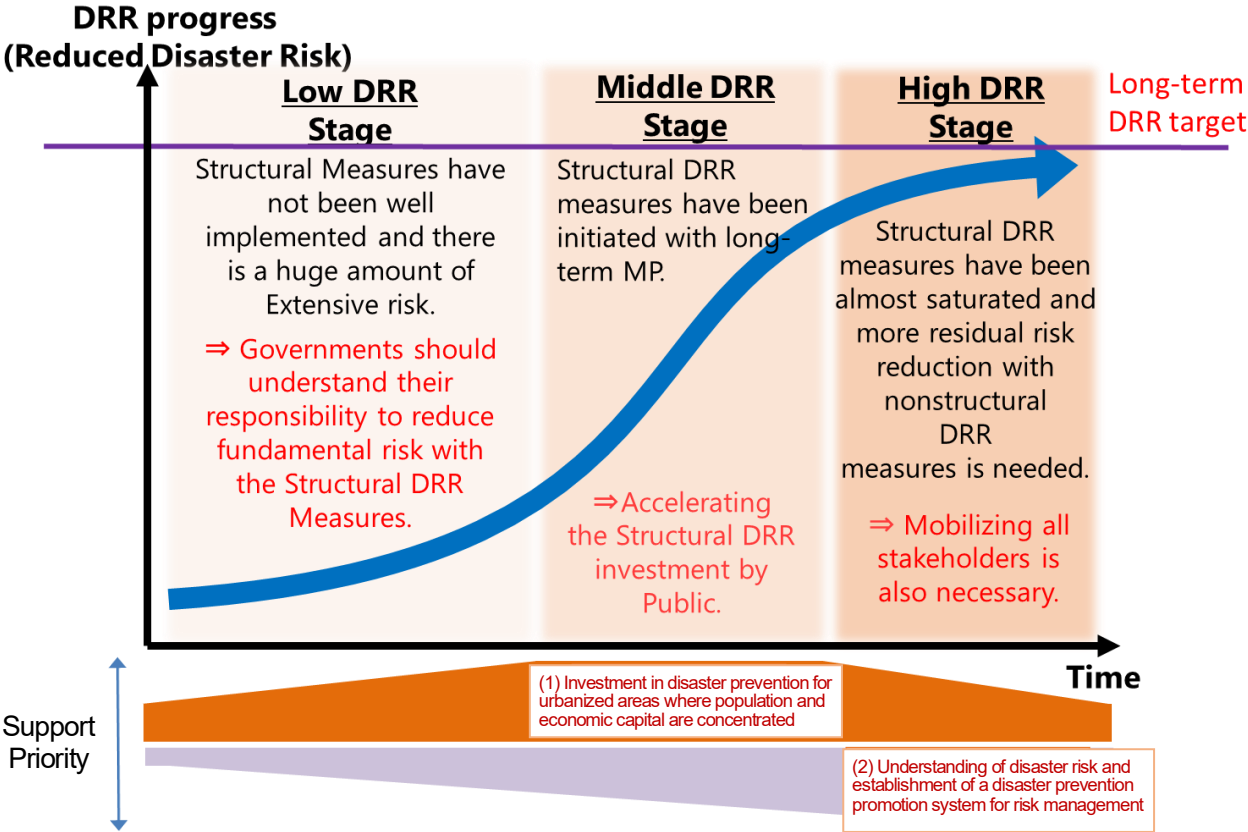


Table 1: Cooperative Approach and Resource Allocation

The following cooperation approaches will be selected for each country¹⁵ (■ indicates technical cooperation projects and □ indicates financial cooperation projects (grant or loan). Underlines indicate core approaches)

Cluster	Target	Phase	Scheme	Responsible organization	Resource allocation
(1) Investment in DRR for urbanized areas where population and economic capital are concentrated	Flood, Landslide, Storm surge etc.	Policy	■Policy advisors, etc. (Technical cooperation) Sector Loan/Program Loan (Financial Cooperation)	■Ministry in charge of flood control / landslide □Ministry of finance, Ministry in charge of flood control / landslide	35% Current situation ¹⁶ Financial 14% Technical cooperation 16%
		Plan	■Development of disaster prevention infrastructure MP/FS (Technical cooperation) ■Development of critical infrastructure MP/FS (Technical cooperation)	■Ministry in charge of flood control / landslide ■Main: Line ministries in charge of infrastructure, Sub: DRR organization, Local government	
			□Construction of disaster prevention infrastructure (Financial cooperation) □Enhancement of critical infrastructure (Financial cooperation)	□Ministry in charge of flood control / landslide □Line ministries in charge of infrastructure	
		O&M	■Enhancement of O&M capacity (Technical cooperation)	■Ministry in charge of flood control / landslide, Line ministries in charge of infrastructure, Local government	
	Earthquake, volcanic, storm, etc.	Policy	■Policy advisors, etc. (Technical cooperation) Sector Loan/Program Loan (Financial Cooperation)	■Line ministries in charge of infrastructure □Ministry of finance, DRR organization, Line ministries in charge of infrastructure	25% Current situation Financial cooperation 48% Technical cooperation 5%
		Plan	■Development of disaster prevention infrastructure MP/FS (Technical cooperation) ■Establishment of a quake-resistance support system for privately-owned assets (Technical cooperation)	■Main: Line ministries in charge of infrastructure Local government, Sub: DRR organization ■Main: Line ministry in charge of building, Sub: DRR organization, Ministry of Industry and Commerce, Local government	

¹⁵ Resource allocation is an image of the allocation of inputs (effort), including human resources, work time, and cooperative preparatory studies.

¹⁶ The total does not add up to 100% because some of the technical cooperation projects do not belong to any of the three clusters.

		Implementation	<input type="checkbox"/> Construction of critical infrastructure (Financial cooperation) <input type="checkbox"/> Quake-resistance support for privately-owned assets (Financial Cooperation) <input checked="" type="checkbox"/> Establishment of a quake-resistance support system for privately-owned assets (Technical cooperation)	<input type="checkbox"/> Main: Line ministries in charge of infrastructure <input type="checkbox"/> Main: Line ministry in charge of building, Sub: Ministry of finance, DRR organization <input checked="" type="checkbox"/> Main: Line ministry in charge of building, Sub: Ministry of finance, DRR organization	
		O&M	<input checked="" type="checkbox"/> Enhancement of O&M capacity (Technical cooperation)	<input checked="" type="checkbox"/> Ministry in charge of flood control / landslide, Line ministries in charge of infrastructure, Local government	
(2) Understanding of disaster risk and establishment of DRR promotion system	Disaster prevention organization	Policy	<input checked="" type="checkbox"/> Policy advisors, etc. (Technical cooperation) <input type="checkbox"/> Sector/Program/Standby Loan (Financial Cooperation)	<input checked="" type="checkbox"/> DRR organization <input type="checkbox"/> Ministry of finance, Line ministry in charge of reconstruction / DRR organization, relevant line ministries	30% Current situation Financial cooperation 30% Technical cooperation 42%
		Plan Implementation	<input checked="" type="checkbox"/> Enhancement of Organizational structure (Technical cooperation) <input checked="" type="checkbox"/> Capacity building for development of disaster reduction strategy and implementation (Technical cooperation) <input checked="" type="checkbox"/> Risk assessment (Technical cooperation)	<input checked="" type="checkbox"/> DRR organization <input checked="" type="checkbox"/> DRR organization Local government <input checked="" type="checkbox"/> DRR organization, Line ministry in charge of development plan, Local government	
	Meteorological line ministry	O&M	<input type="checkbox"/> Strengthening of observation network (Financial Cooperation) <input checked="" type="checkbox"/> Enhancement of meteorological and earthquake observation capacity (Technical cooperation)	<input type="checkbox"/> Meteorological line ministry <input checked="" type="checkbox"/> Meteorological line ministry	
(3) Build Back Better	Structural	Plan	<input checked="" type="checkbox"/> Development of MP/FS for reconstruction (Technical cooperation)	<input checked="" type="checkbox"/> Main: Line ministry in charge of reconstruction, Line ministries in charge of infrastructure, Local government, Ministry of finance	10% Current situation Financial cooperation 8% Technical cooperation 15%
		Implementation	<input type="checkbox"/> Disaster prevention infrastructure (Financial Cooperation) <input type="checkbox"/> Critical infrastructure (Financial Cooperation) <input type="checkbox"/> House reconstruction (Financial Cooperation) <input checked="" type="checkbox"/> House reconstruction (Technical cooperation)	<input type="checkbox"/> Ministry in charge of flood control / landslide <input type="checkbox"/> Line ministries in charge of infrastructure <input type="checkbox"/> Line ministry in charge of reconstruction, Line ministry in charge of building, Local government <input checked="" type="checkbox"/> Line ministry in charge of reconstruction, Line ministry in charge of building, Local government	
	Non-structural	Policy	<input type="checkbox"/> Sector/Program/Standby Loan (Financial Cooperation)	<input type="checkbox"/> Ministry of finance, Line ministry in charge of	

				reconstruction / DRR organization, relevant line ministries	
		Implementation	<ul style="list-style-type: none"> ■ Comprehensive vulnerability assessment (Technical cooperation) ■ Promoting risk understanding (Technical cooperation) ■ Enhancement of support for most vulnerable layer (Technical cooperation) 	<ul style="list-style-type: none"> ■ DRR organization, Ministry of finance, Line ministry in charge of health and welfare ■ DRR organization, Local government ■ DRR organization, Line ministry of other sectors 	

What is the JICA Global Agenda?

JICA's cooperation strategies for global issues. JICA, with its partners, aims to show global impacts realizing the goals set under JICA Global Agenda. JICA Global Agenda and its goals will be shared among partner countries and various actors, enhancing dialogue and collaboration, therefore, maximizing the development impacts. Through these efforts, JICA will comprehensively contribute to the achievement of the SDGs by 2030 as well as realize Japan's Development Cooperation Charter which focus on "human security," "quality growth," and "addressing global challenges".



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Japan International Cooperation Agency (JICA) is an international cooperation organization that is centrally responsible for the implementation of bilateral assistance among Japan's Official Development Assistance. JICA cooperates with about 150 countries and regions around the world.

https://www.jica.go.jp/english/our_work/thematic_issues/index.html