

Disaster Recovery Guidebook

Road Sector in Cambodia

TRANSPORT



Report Details

Report Subject	: Disaster Recovery Guidebook
Project	: UNDP-ADB Project Building Disaster-Resilient Infrastructure through Enhanced Knowledge (TA-9955).
Assignment Title	: Lead and coordinate sectoral adaption of PDNA methodology to the Transport and Roads Sector in Cambodia and formulation of Roads Sector Recovery Guidelines.
Country	: Cambodia
Report Date	: March 16, 2023
Report Status	: Final
Report submitted to	: Ms. Rita Missal UNDP Ms. Joana Sampainho UNDP Mr. Chhum Sovanny UNDP Mr. Sophal SAM UNDP
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Acknowledgments

The Disaster Recovery Guidebook for Cambodia's Road Sector was prepared under the Asian Development Bank (ADB) technical assistance project Building Disaster-Resilient Infrastructure through Enhanced Knowledge. Grant funding for the project came from the Japan Fund for Prosperous and Resilient Asia and the Pacific (JFPR), financed by the Government of Japan through ADB.

The technical assistance project was implemented by the United Development Programme (UNDP) in collaboration with the National Committee for Disaster Management (NCDM). The Disaster Recovery Guidebook for Cambodia's Road Sector is a result of collaboration and continuous support and inputs from various partners, including Cambodia Task Force Members – Ministry of Public Works and Transport (MPWT), Ministry of Rural Development (MRD), and Ministry of Water Resources and Meteorology (MoWRAM). The guidebook was commissioned as part of the partnership between the Asian Development Bank (ADB) and the United Nations Development Program (UNDP) to deliver Output 3 (resilient recovery capacity enhanced) of the Knowledge and Support Technical Assistance (KTSA) program on Building Disaster Resilient Infrastructure through Enhanced Knowledge. The UNDP-ADB Project aims to enhance technical capacities for recovery planning, and implementation, including adapting the Post Disaster Needs Assessment (PDNA) guidelines to national contexts and specific infrastructure sectors and developing context-specific disaster recovery guidance, with the focus of this guidance being Cambodia's road sector.

This guidebook has been prepared by independent consultant Dr. Prerna Singh, under the overall supervision and technical guidance of Ms. Rita Missal, UNDP Recovery Advisor, Ms. Joana Sampainho, UNDP's Recovery Analyst, Mr. Sovanny Chhum, UNDP Cambodia Program Analyst, and in close collaboration with Mr. Sophal SAM, the National Project Coordinator in Cambodia.

On behalf of everyone involved in developing this guidance, we would like to thank the ADB and UNDP for providing financial and technical championships by incorporating the development of this guidance in the Resilient Recovery Capacity Enhanced project. Thanks to their leadership, this guidance will be readily available to Cambodian government officials and other relevant stakeholders for their use.

We thank the Government of Cambodia and officials of MPWT and MRD who took the time to give valuable input based on their vast knowledge and experience. We acknowledge with appreciation those who conducted the background work, including previous PDNAs, disaster recovery plans, training, and road sector development guidelines.

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Acronyms and Abbreviations

ADB	Asian Development Bank
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BBB	Building Back Better
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CamDi	Cambodia Disaster Damage and Loss Database
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CCDM	Commune Committee for Disaster Management
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DCDM	District Committee for Disaster Management
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DRF	Disaster Recovery Framework
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DRR	Disaster Response and Recovery
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EU	European Union
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FASMEC	Federation of Associations of Small and Medium Enterprises in Cambodia
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FHWA	Federal Highway Administration
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GFDRR	Global Facility for Disaster Reduction and Recovery
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GRADE	Global Rapid Post-Disaster Damage Estimation
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GRM	Grievance Response Mechanism
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HRF	Humanitarian Response Forum
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IFI	International Financial Institutions
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IRI	International Roughness Index
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JAG	Joint Action Group
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LDC	Least Developed Countries
M&E	Monitoring and Evaluation
MEF	Ministry of Economy and Finance
MIS	Management Information System
MoE	Ministry of Environment
MoWRAM	Ministry of Water Resources and Meteorology
MPWT	Ministry of Public Works and Transport
MRD	Ministry of Rural Development
NCDM	National Committee for Disaster Management
NGO	Non-Governmental Organization
O&M	Operation and Maintenance
PADEK	Partnership for Development of Kampuchea
PCDM	Provincial Committee for Disaster Management
PDNA	Post Disaster Needs Assessment
PSR	Present Serviceability Rating
RGC	Royal Government of Cambodia
UNDG	United Nations Development Group
WB	World Bank

Introduction

The post-disaster setting is a complex and demanding environment, which needs a fast-paced response for assessing immediate needs and providing life-saving relief while also assessing the damages and losses and effectively planning for recovery to ensure a sustainable development process where risk reduction in the face of disasters is explicitly considered.

The recovery phase in response to a disaster signals a shift from immediate emergency relief to the restoration of systems in a way that balances the short-term needs while establishing a better system to minimize the negative impacts of potential future disruptions. This emerges from the recovery needs identified in the post-disaster needs assessment (PDNA) process and leads to the development of a Disaster Recovery Framework (DRF).

A DRF provides a country with a recovery process that unites all relevant stakeholders – government, private sector, donors, development partners, and community, to recover after a disaster with a focus on building back better, stronger, and more inclusively in the short, medium, and long term. (GFDRR, 2020) The framework is generally developed after a disaster, incorporating the contextual effects of the disaster in the recovery strategy. This can take anything between 4-8 weeks post-disaster.

This guidebook combines the process outlined by the GFDRR Disaster Recovery Framework Guide (GFDRR, 2020) with the knowledge from the research literature on disaster response, recovery, and resilience planning. This guidebook provides contextual disaster recovery guidance, which covers the aspects necessary for an efficient, better, and equitable recovery after a disaster, specifically for the road sector of Cambodia.

Context

The Index for Risk Management (INFORM) Global Risk Index (GRI) for Cambodia presents the risk profile of the country. Floods are identified as the hazard with the highest exposure score in Cambodia (9.5/10), with nearly 75% of the country's land being part of the Tonle Sap Lake's floodplain. Typhoons and tropical cyclones, together forming the second set of high exposure hazards, also present significant consequences to the country's social and economic growth.

The persistence of hazards, along with the social and economic vulnerability of the country, increases the negative impacts of such disruptions. Damage related to the October 2013 flooding alone, caused by heavy rain and the seasonal swelling of the Mekong River, was estimated at \$356 million and affected 20 out of 24 provinces and 1.7 million people.

The road sector, which is the focus of this guidebook, is the largest subsector of Cambodia, with a total road length of over 61,000 Kms. Roads account for 65% of freight and 87% of passenger traffic in Cambodia. Roads are also one of the systems most affected by floods and typhoons. Data from the Cambodia Disaster Damage and Loss Database (CamDi) shows that from 2000 to 2014, a combined length of 10,191 km of roads has been submerged in floods or rainwater, 47 percent of which were damaged, and 21 percent were destroyed.

Typhoon Ketsana in 2009 caused damage to road networks in 18 provinces in Cambodia. Losses amounting to \$11.07 million were primarily attributed to higher vehicle operating costs and longer freight and passenger travel times associated with worsened road conditions. In 2011, floods affected 18 out of 24 provinces in Cambodia. Damage was estimated to be about eight times higher at \$328.6 million, and loss doubled (\$23.3 million) than Typhoon Retsina in 2009.

Even if the disruption does not structurally damage a road, floods and typhoons disrupt their functionality during the duration of the disaster. This restricts the movement of goods and people for essential activities such as evacuation, medical supply, food and water supply, education, and in general everyday social and economic activities. Immediate response is critical to restoring road segments essential for emergency services functioning. In contrast, long-term recovery planning of road sections is needed to facilitate community and economic restoration post-disasters.

Structure of the guidebook

This Disaster Recovery Guidebook provides a practice-based, results-focused approach to the Cambodian government and partners for a resilient post-disaster recovery of the road sector. It presents a general DRF for road sector recovery and guides appropriate calibrations needed to develop disaster-specific DRFs for the road sector after a major disaster. This guidebook consists of the following four modules contextualized for Cambodia's road sector:

- Pre-disaster planning for disaster recovery
- PDNA to DRF continuity
- Recovery policy
- Institutional arrangements for recovery
- Financing mechanisms
- Recovery implementation procedures

Lessons learned from previous PDNAs, and Cambodia's road sector disaster management have been integrated throughout the document, which can serve as recommendations for Cambodian officials to refer to during the development of a DRF post-disaster.

Pre-Disaster planning for recovery

For each segment of the DRF to be successfully implemented in the post-disaster recovery phase, pre-disaster planning is needed. Anticipation and preparation before a disaster strikes can greatly facilitate response to a disaster in faster, streamlined, and more inclusive ways. This includes strengthening the systems that will be critical during post-disaster phases and establishing arrangements that can reduce the time spent in the recovery activities post-disaster. The systems that are critical to disaster recovery in the context of the road section include

- 1** the institutional arrangements designed to manage the road sector by Ministry of Public Works and Transport (MPWT) & Ministry of Rural Development (MRD),
- 2** the stakeholders involved in the recovery process, primarily the National Committee on Disaster Management (NCDM), and the Provincial and Communal committees of disaster management (PCDMs and CCDMs),
- 3** the financial system set up to manage road development and recovery after disruptions by the Ministry of Economy and Finance (MEF).

The three specific pre-disaster planning elements that can be used to strengthen recovery systems prior to disasters are:

- System performance and risk analysis,
- General recovery framework
- financial preparedness plan

The condition and performance analysis conducted of the road system before a disaster can serve as the baseline to measure the damage and loss from a disaster, and the vulnerability analysis can inform the recovery needs, both crucial parts of the PDNA process. The general recovery framework developed before the event (provided in this guidebook) already encapsulates the context sensitivity of the road sector and Cambodia and only needs to be recalibrated based on the specific disaster and identified needs. It can serve as a starting point that aligns with the development goals of Cambodia's road sector, thereby shaping the DRF in the right direction with minimum post-disaster efforts. Additionally, a financial preparedness plan will support the quick implementation of the DRF post-disaster.

This guidebook provides the foundation for the three pre-disaster planning elements within each section and highlights the existing elements of Cambodia's preparedness in each of the DRF elements and how they interact with the actions to be taken post-disaster.

PDNA to DRF Continuity

A post-disaster needs assessment (PDNA) is a prerequisite for developing a DRF. The PDNA is a methodology developed jointly by the EU, and UN, and the World Bank that supports governments in assessing damages, loss, and recovery needs. At the national scale, it is a multi-sectoral exercise led by NCDM, MPWT, MRD, and PCDMs of the affected provinces, that facilitates the transition from relief to development. While the National Committee for Disaster Management (NCDM) leads the PDNA process, Ministry of Public Works and Transportation, and Ministry of Rural Development provide the contextual detail of the road infrastructure damage and loss, and the Provincial Committees of Disaster Management (PCDM) support the PDNA process at the provincial level. Detailed guidance on the road sector PDNA process for Cambodia is developed as part of the UNDP-ADB Project Building Disaster Resilient Infrastructure through Enhanced Knowledge (Singh, PDNA Guidelines: Roadways Sector in Cambodia (Draft), 2022).

The Disaster Recovery Framework follows PDNA and answers the question of ‘how’ the recovery needs will be met and the recovery strategy will be implemented. PDNA focuses on the effects, impacts, and needs assessments and introduces the recovery strategy. The DRF focuses on the recovery strategy (Figure 1) and is more detailed on the recovery measures, with focuses on developing frameworks for institutionalizing the strategy, developing implementation systems around it, and identifying financial mechanisms to support the process. It also provides sequencing of the recovery activities based on prioritization, available financing, and implantation arrangement capacities of the sector and country, streamlining the short, mid, and long-term needs accordingly.

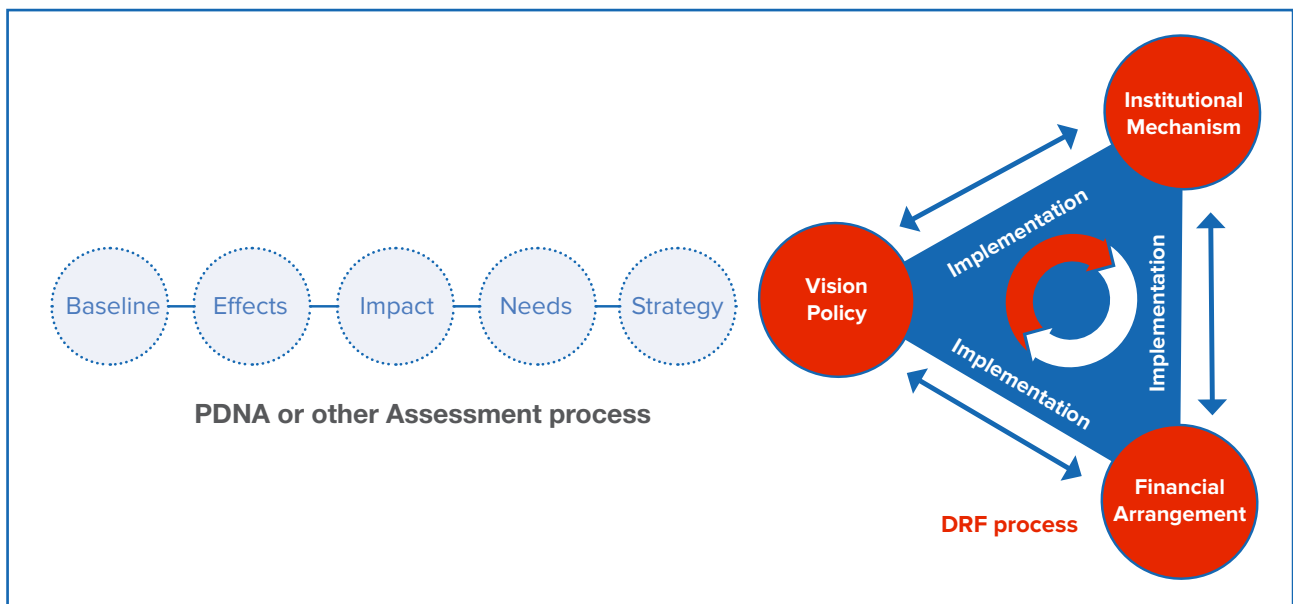


Figure 1: PDNA to DRF transition (GFDRR, 2020)

It is critical for stakeholders engaged in developing DRF to be cognizant of the need for this continuity. A good practical way to ensure this continuity is to ensure the movement of data and information on recovery policies and resilience and sustainability objectives to those who might be charged with leading the immediate response post-disaster. The Ministries of Public Work & Transport & rural Development (MPWT and MRD respectively) will hence need to regularly have information exchange between them, the Royal Government of Cambodia (RGC), and the National, Provincial, and Communal Committee for Disaster Management (NCDM, PCDM, and CCDM respectively) on road sector sustainability and resilience goals, national overall goals on sustainable development, and NCDM’s goals on disaster response.

Road Sector Recovery Policy

The recovery policy segment of the DRF focuses on establishing a statement of intent to guide decisions for recovery. This DRF segment for the road sector sets targets and establishes principles for recovery of the road infrastructure condition, mobility, and accessibility services to the community to the pre-disaster level or to a better level in accordance with the building back better approach.

The key elements of a recovery policy include the following:

- The central vision of recovery
- Guiding principles of recovery
- Recovery programs identification
- Planning for land use

Finally, the road sector policy should be in alignment with the Sustainable Development Goals.

Transportation plays a key role in achieving the **SDGs 1 and 2**, no poverty and agricultural productivity, with the provision of connected road access; **SDG 3**, good health and wellbeing with a reduction in road crashes (Target 3.6), and pollution (Target 3.9); **SDG 7**, affordable and clean energy through the energy efficiency of transport (Target 7.3); **SDG 8**, economic growth and full and productive employment; **SDG 9**, industry, innovation and infrastructure with sustainable infrastructure for all (Target 9.1); **SDG 11**, sustainable cities and communities with sustainable urban public transport systems (Target 11.2); **SDG 12**, responsible production and consumption with reductions in fuel subsidies (Target 12.2) and also reduction in food loss and waste (Target 12.3); **SDG 13** climate action with contributions to climate change adaptation (Target 13.1), climate change mitigation (Target 13.2); and oceans, seas, and marine resources (World Bank, 2016).

The intentional connection of the recovery policies with the SDGs can also be leveraged in funding requests for grants focused on enhancing the SDGs.

Central vision of recovery

Based on the review of Cambodia's road sector growth vision, Cambodia's national recovery vision, and the country's overall growth strategy as of 2022, the central vision of recovery for road sector should focus on:

“Providing **safety, mobility, and accessibility** to the community, focusing on ensuring **integration** of rural communities with **mainstream economy**, and **efficiently restoring & modernizing** the road infrastructure and institutions for resilience”

This recovery vision is derived by integrating Cambodia's national development strategy, NCDM's disaster recovery vision, MPWT &MRD's road sector growth vision, and ADB's road sector growth vision for Cambodia. To review these underlying visions, please refer to Box 1.

Box 1: Cambodia's strategic vision, NCDM's recovery vision, and Cambodia's transport sector's growth vision

The current vision of Cambodia's national development follows a rectangular strategy of Growth, Employment, Equity, and Efficiency (ADB, 2019). The phase IV of the Rectangular Strategy, launched in 2018, considers the following four objectives as the key priorities:

- Ensure economic growth of 7%
- Create more jobs
- Achieve the poverty reduction target below 10%
- Further strengthen the capacity and governance of public institutions

The National Action Plan for Disaster Risk Reduction (NAP-DRR) 2019-2023 identifies the priority actions across the following five areas (CFE-DM, 2020):

- Understanding risks
- Disaster risk governance
- Investing in/ financing disaster risk reduction (DRR)
- Enhancing preparedness and building back better (BBB)
- Ensuring coherence and inclusiveness

The strategic vision of the transport sector of Cambodia for a long period has been to restore, reconstruct, and modernize the country's core transport system. One of the draft strategies developed by MPWT for transport sector development identified the following as the five main objectives:

- A cost-effective transport system, especially for logistics – to support sustained economic growth and promotion of external trader and foreign direct investments
- Integrating rural areas with the mainstream economy by linking them through transport access, thereby encouraging productive activities in previously not integrated areas – to support poverty reduction and integration of the country

Figure 2 presents the needed flow of review of the road sector recovery vision, based on a review of the evolving needs and visions from NCDM, PCDM, MPWT & MRD, and international agencies.

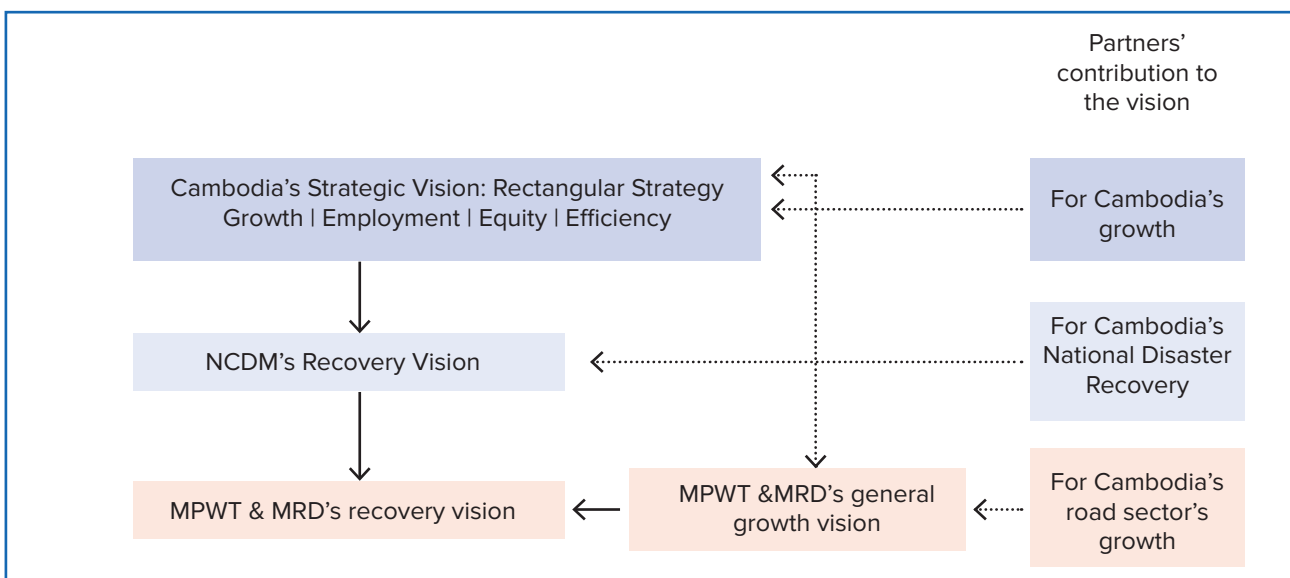


Figure 2: Inputs to the recovery vision of MRWT and MRT (author's rendition)

Guiding principles of recovery

For Cambodia's road sector, the following overarching principles, derived from Cambodia's general principles of growth and recovery via literature review, could be used to guide the recovery planning (GFDRR, 2018):

- **Mitigate risks:** either by relocating transportation structures from high-risk areas or retrofitting them to reduce vulnerability
- **Improve access and mobility:** providing access to communities in currently inaccessible places, either due to disaster or because of social conditions, will support job opportunities, access to essential services, and overall economic growth
- **Apply green and climate-smart solutions:** identifying opportunities to reduce GHG emission from the road sector is a direct way of mitigating climate change, therefore mitigating risks
- **Innovate low-cost, high-impact solutions:** For an economy already struggling with capital support, innovative efforts in low-cost solutions will be key in speeding the recovery process.
- **Be future-oriented:** aligning the recovery efforts to the long-term goals of the country, and the sustainable development goals, creating a positive loop of support to and from the national systems
- **Focus on Equity and Inclusivity:** incorporate views of all community members being affected by the road sector and changes in it, and make intentional efforts to create access to jobs and markets for everyone
- **Focus on Efficiency:** Meet transport demand effectively to promote seamless movement of people and goods.
- **Promote safety:** Utilize the disruption to enhance the future safety of the roads
- **Build Back Better:** Aligned with the general recovery principle, utilize the opportunity of the reconstruction as a means to improve the system and reduce the deficiencies of the transport system previously identified.

Every recovery program and project needs to follow at least one of these principles.

Calibration needs after a major disaster

While the vision and principles for the road sector recovery will stay the same for a good period of time, it is important to periodically review them to see if the sector recovery vision and principles may change after the disaster.

During a post-disaster period, check for the following:

- 1 Has there been a considerable gap (> 10 years) between the development of this vision and the occurrence of the disaster at hand?

AND/OR

- 2 Has there been a significant change in the overall goals of the country or of the road sector?
- 3 If either 1 or 2 are true, review the recovery vision based on the flow chart in Figure 4, and make needed changes – MPWT & MRD should lead this review.

Review the updated road sector recovery vision by the key stakeholders – Royal Government of Cambodia, NCDM, relevant PCMDs and CCDMs, and international agencies such as ADB.

Road sector recovery programs

The recovery plan developed based on the recovery needs identified in the PDNA process further needs to be translated into actionable programs. These programs should have defined boundaries, inputs, targets, and pre-defined expected outputs and outcomes.

It is important to keep in mind that various sectors will compete for available resources to complete their recovery programs. Since the transport sector cuts across all other sectors (social, production, and infrastructure), transport officials need to address interdependencies and work with other sectors to optimize recovery outcomes. Figure 3 presents the relevant sectors in the productive, infrastructure, and social segments that compete during a DRF implementation process. As indicated, the transport sector influences all the productive and social sectors. Hence there is value in developing collaborative programs that serve both sectors.

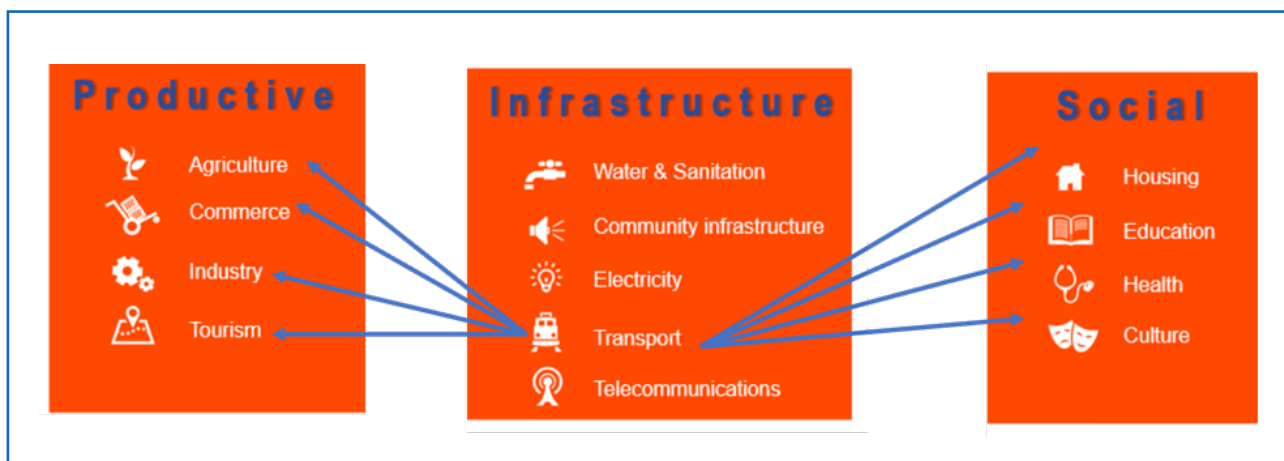


Figure 3: Connection of the transport sector with the other critical sectors

The recovery programs are led by the MPWT and MRD and they should , define action steps to bridge the recovery needs in alignment with the vision and guiding principles identified before.

The development of recovery programs for the road sector should follow the following steps:

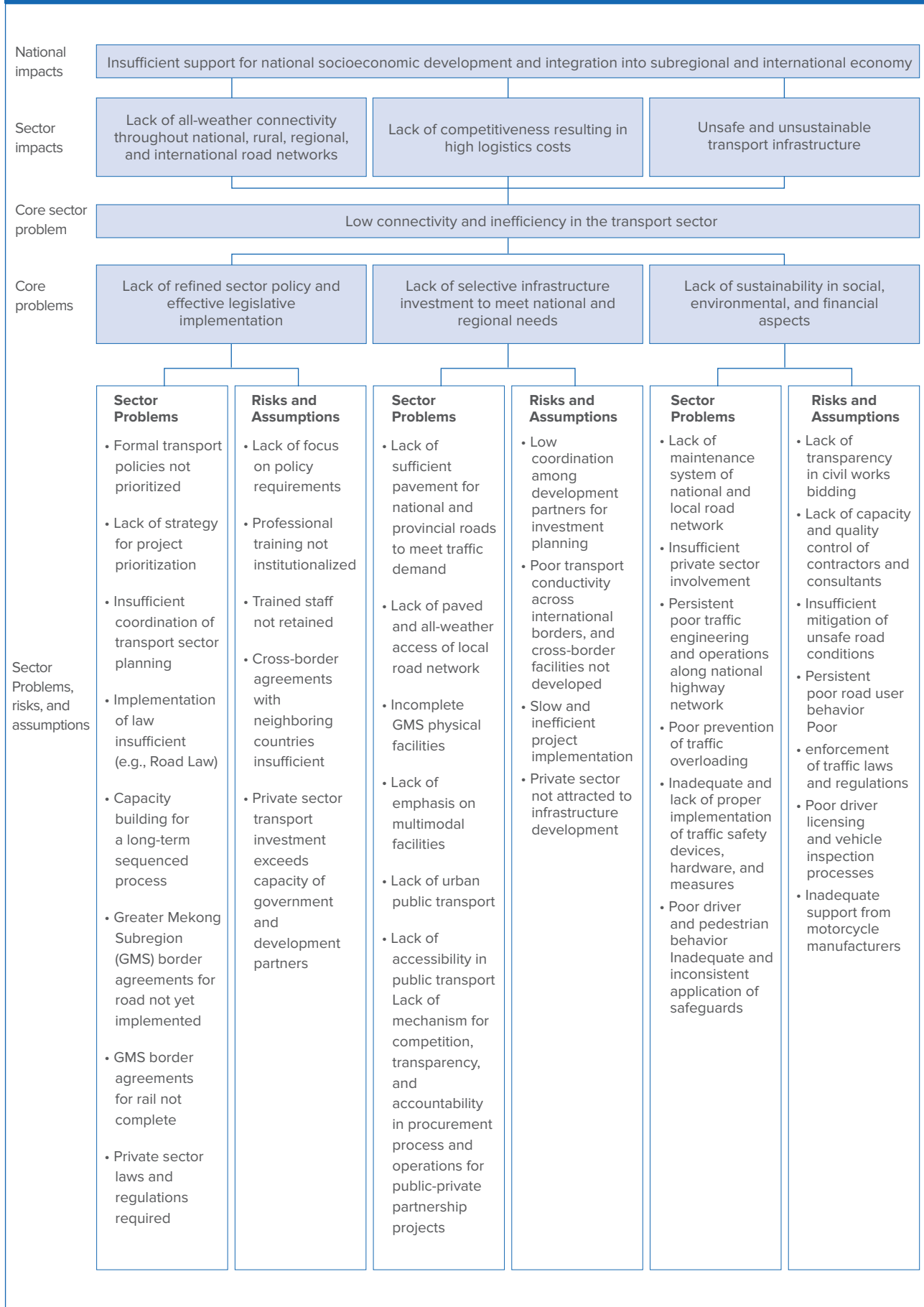
- Identify the highest priority needs of the road sector based on the damages incurred to the system (PDNA results)
- Identify the geophysical locations that need to be prioritized based on their importance to Cambodia’s economy and general accessibility to essential services
- Sequence the segments of road sectors for recovery based on the identified prioritization
- Consult experts and all relevant stakeholders to define potential solutions in the context of the identified regions and the identified needs. The key stakeholder groups (other than the MPWT and MRD leads) to include are:
 - o Public sector: Line Ministries of sectors that interact with the road sector (see figure 4)
 - o Social sector: The community affected by the disaster, and the NGOs working closely with these communities (see Box 4 in the section of road sector institutional arrangement for the latest list of social sector partners for Cambodia’s disaster recovery)
- Review the identified solutions for social safeguard and environmental safeguards to ensure no significant harm is caused due to the projects in these areas

In general, engineering solutions for resilient roadways recovery need to focus on:

- Subsurface conditions
- Material specifications
- Cross-section and standard dimensions
- Drainage and erosion
- Protective engineering structures

Previously identified gaps in the transport sector by various studies can be leveraged as a dataset to support the prioritization of the needs. For example, Box 2 presents the problem tree identified for Cambodia’s transport sector as part of the development of the Cambodia Transport Sector Assessment, Strategy, and Roadmap document by ADB (ADB, 2019).

Box 2: Cambodia's Transport Sector Problem Tree (ADB, 2019)



The problem tree in Box B, along with similar problems in the road sector identified since 2019 can be mapped with the post-disaster recovery needs, and any initiatives taken to remedy the identified issues can be leveraged to support the recovery projects. For example, the roadmap identifies multiple ongoing and future projects aimed at resolving the problems. This includes programs such as project loan programs for road improvement and capacity building programs for MPWT. These existing programs can provide the setup for post disaster recovery efforts.

A fact-finding mission in 2010 on Cambodia's road sector vulnerabilities identified specific vulnerabilities in the three major regions – Khampong Thom region's road network was identified to have a challenge of runoff, causing major health issues downstream, both in the dry seasons with dust, and wet seasons with water runoff. Thus, paving the road segments while also making design considerations to ensure proper water drainage is important in this region. Khampong Speu's roads were identified in need of vegetation cover on the embankments to prevent erosion. Pursat's roads were identified to be in flood zone and low-lying, making them prone to flooding. Raising the road segments in this region hence should be of high priority.

Matching the recovery needs of the PDNA with these already identified gaps in Cambodia's road sector can lead to combining the existing efforts with disaster-specific recovery programs.

For Cambodia's road sector, based on previous PDNAs and recommended recovery strategies, the following potential solutions could be considered:

- Synthetically upgrading the existing structure of low-level roads by raising them 0.5 meters (or the amount better suggested by the experts based on the post-disaster flood plain and sea level rise scenarios)
- Adding a crushed stone base course – which, if done in a medium-term recovery effort, can be then followed in the future by the application of Asphalt Concrete (AC) for urban, national, and provincial roads; and the Double Bitumen Surface Treatment (DBST) for rural roads.
- Updating the slope of the roads where instability of the road is a high-risk factor – the current standard for the slope of roads is 1:2 or less, which could be updated to 1:3 for critical and at-risk roads (Royal Government of Cambodia, 2010).
- Incorporating nature-based solutions such as planting climate change-resilient trees along road embankments

Plan for land use

Transport infrastructure is designed to last for decades and more. The transport structure also plays a major role in establishing land use patterns. For example, in Cambodia, connecting the missing links and improving the road quality of the Greater Mekong Subregion (GMS) corridors will increase the economic activity in the region, thereby promoting relocation of more people in the area, creating a higher need of residential and other land use development. Hence, it is important when reconstructing roads to see if the disasters have changed the land use patterns, to mitigate the risk that rebuilding permanent transport infrastructure is counterproductive and creates poor land use outcomes in the future. The MPWT and MRD team focused on recovery needs to identify if there are any land use plans that should be accounted for prior to project implementations.

The key things to look for after a disaster are:

- Was there any recent land use pattern change identified before the disaster,
 - o E.g., movement of people from rural to urban regions, or from one urban to other urban regions due to changes in the economic streams?
- Did the disaster led to any significant change in land use pattern,
 - o E.g., permanent relocation of communities outside a certain region?
- Will the identified recovery programs alter the land use pattern?
 - o E.g., deciding on relocating a major road due to increased disaster risk can affect the future residential and work zone development patterns
 - o If so, carefully assess that the potential change in land use pattern does not negatively affect the vulnerable population (cutting off/reducing direct access to work zones and essential services for certain communities)

Road Sector Institutional Arrangements for Recovery

To develop, implement, assess, and enhance recovery plans, programs, and policies in an efficient fashion, institutional arrangements need to be identified and streamlined. Confirming institutional arrangements and clarifying roles/responsibilities is critical at both the national, local, and community levels.

In Cambodia, the National Committee for Disaster Management (NCDM) has the lead coordination function focused on disaster preparedness, emergency relief, and coordination between different line ministries and donor communities. The sectoral line ministries, which in the case of the road sector are MPWT and MRD, are responsible for implementing specific structural interventions for DRR and for the restoration and recovery of damaged road infrastructure (ADB, 2014).

NCDM is established as the institution to lead disaster management in Cambodia. It is chaired by the Prime Minister and comprises ministers of each government agency, plus the Royal Cambodian Armed Forces, Cambodian Red Cross, and Civil Aviation Authority (ADB, 2014). The disaster management is then further decentralized into the provincial, district, and commune-level Committees for Disaster Management (PCDM, DCDM, and CCDM, respectively). The institutional framework for disaster management at the national level is presented in figure 4. For the Road sector, MPWT and MRD are represented in the working team of ministries and take the lead in recovery of the sector.

MPWT has several key departments which are relevant for recovery of the road sector. The departments include the following and highlighted in figure 5:

- General Department of Techniques
 - Department of Road Infrastructure
 - Department of Public Infrastructure
 - Department of Techniques for Public Works and Transportation
 - National Institute of Technical Training for Public Works and Transport
 - General Department of Land Transport
 - Department of Land Transport
 - Department of Road Safety
 - Department of Urban Public Transport
 - General Department of Public Works

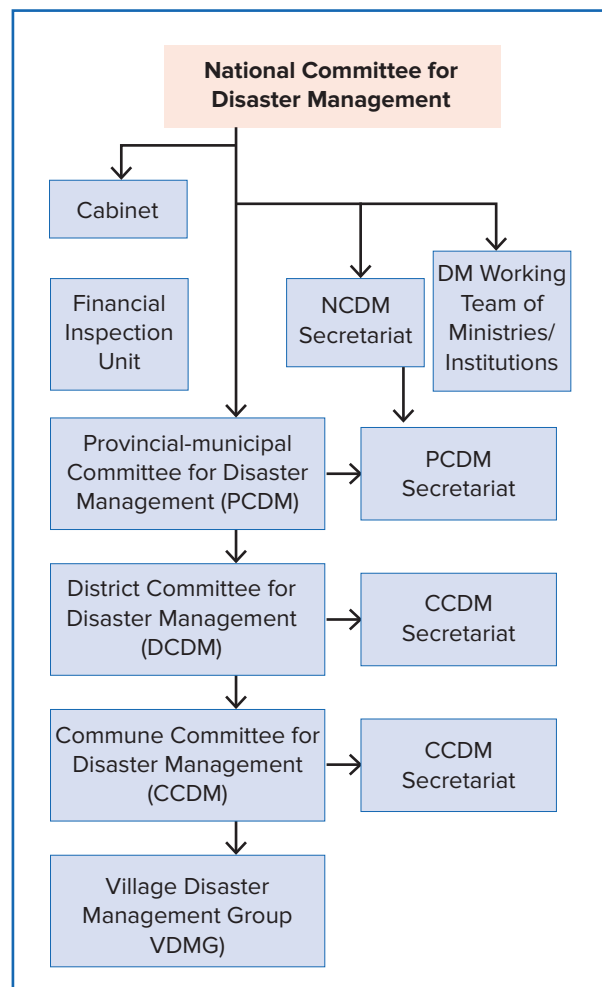


Figure 4: Disaster Risk Management Institutional Framework of Cambodia

- Department of Expressways
- Department of Bridge and Investment
- Department of Equipment and Road Construction
- Department of Repair and Maintenance
- General Inspectorate
- Financial Monitoring Unit
- Procurement Unit
- All the Municipal and Provincial Departments of Public Works and Transport affected by the disaster

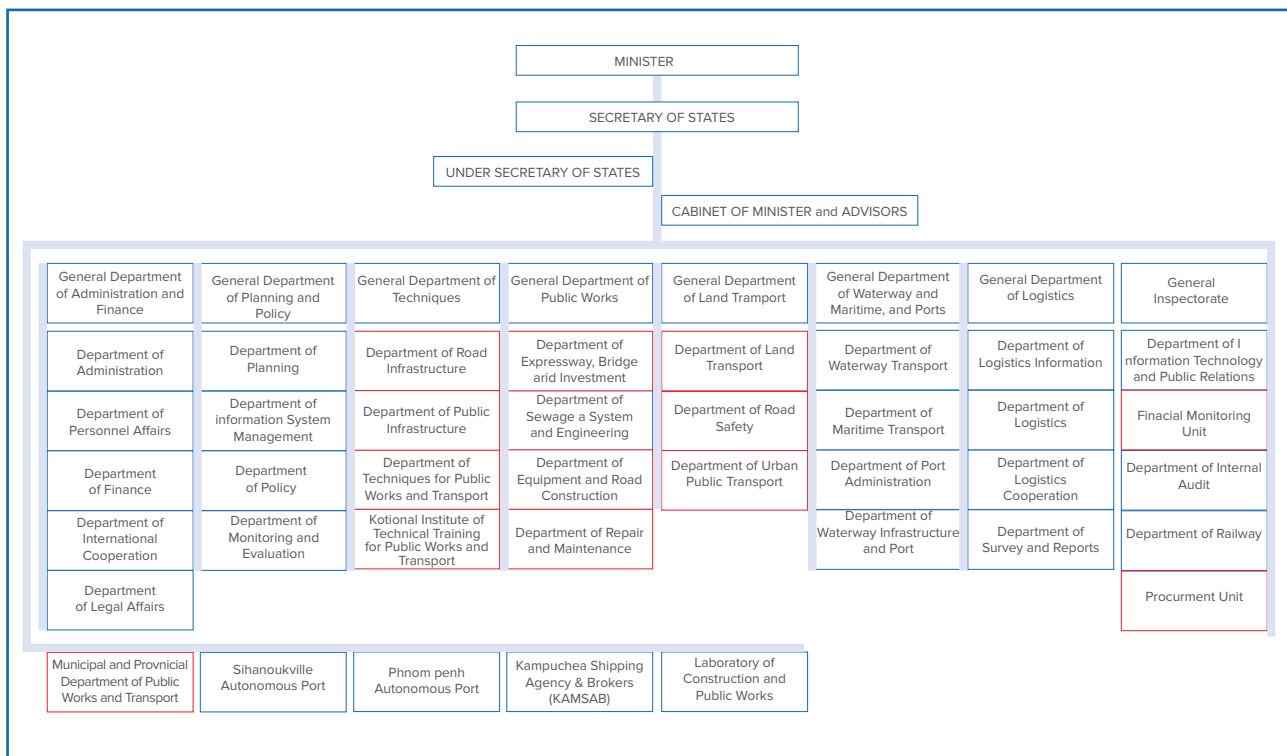


Figure 5 - MPWT organizational chart. Highlighted departments are relevant for DRF planning

Legislate and clarify roles and responsibilities and establish an operational framework

As MPWT and MRD are the two main leads identified for road sector recovery in Cambodia, it is crucial to clearly articulate their roles and responsibilities during disaster recovery.

In order to develop an efficient DRF, MRWT and MRD need to appoint an official from MPWT to lead the national & provincial road recovery and from MRD to lead the rural road recovery. It is important that the lead officials are politically respected and competent. Empathetic leadership is crucial to ensure political and community ownership and secure recovery financing.

It is in the best interest of the line ministries and the lead officials appointed for recovery to create a transportation recovery coordination group. It is useful to align the transport recovery coordination group with the wider national recovery coordination mechanism, convening daily meetings at first, then weekly, etc., as appropriate, to support the implementation of the Recovery Plan.

The responsibilities of the transport recovery coordination group include:

- Appoint a leader of the transport recovery coordination group who will be connected and engaged at the highest level with the lead agency of the overall recovery
- Collaborate with other sectoral recovery planning and implementation operations
- Support decentralized implementation of recovery activities by empowering local ownership and decision-making with the local municipal and Provincial Departments of Public Work and Departments.
- Serve as a central repository of transport sector recovery information
- Establish a public information office to disseminate pertinent information to the affected population
- Minimize duplication, redundancy, or inefficiencies in transport sector recovery
- Adjudicate complaints, grievances, and other concerns of affected individuals and groups, feeding them back into the recovery planning process

The appointed recovery lead will have to establish systems for appropriate staffing for recovery. This may be a challenge based on the nature and scope of the disaster. In such situations, pre-established connections with external stakeholders such as NGOs, educational institutes, and international organizations can help by providing external experts to support the recovery planning process.

Set milestones for the transition from disaster recovery to post-disaster development

Eventually, business as usual will be re-established. There may be a decrease in the recovery pace, and funds may be diverted, leading to competition for resources. It is often around the one- and three-year points of recovery efforts where funding and coordination support halts and recovery is waylaid—leaving communities feeling abandoned. It is important to plan for this decrease in pace, lack of political interest, and funding and institutionalize the critical aspects of recovery such that they are not solely dependent on the factor of urgency. This can be established by developing clear guidelines and milestones for transitioning from disaster recovery and reconstruction to post-disaster development.



Photo: Phnom Penh Post, 03 December 2021

Road Sector Financing Mechanisms

A key aspect of the successful implementation of recovery plans and programs is the availability of funding resources to support the implementation. For the transportation sector, this is especially challenging as rebuilding transport infrastructure is expensive, especially if it is to be built back better for resilient development. As the road sector is public, most of the funding is acquired from public sources.

The key elements of post-disaster recovery financing include:

- Resource mobilization
- Coordination and allocation
- Funds flow expenditure and accounting
- Auditing monitoring and oversight

As the first step to request funding, the road sector team needs to use the damage and loss assessment from PDNA to make a case for fund requests to various channels.

Figure 6 is captured from the Disaster Financial Preparedness Analysis Report developed as part of ADB and UNDP’s recent efforts to support the development of financial preparedness planning and post-disaster budget executing capabilities in Cambodia (UNDP, 2022). The figure is developed after consulting with the relevant stakeholders involved in the financial setup of disaster planning for Cambodia’s road sector.

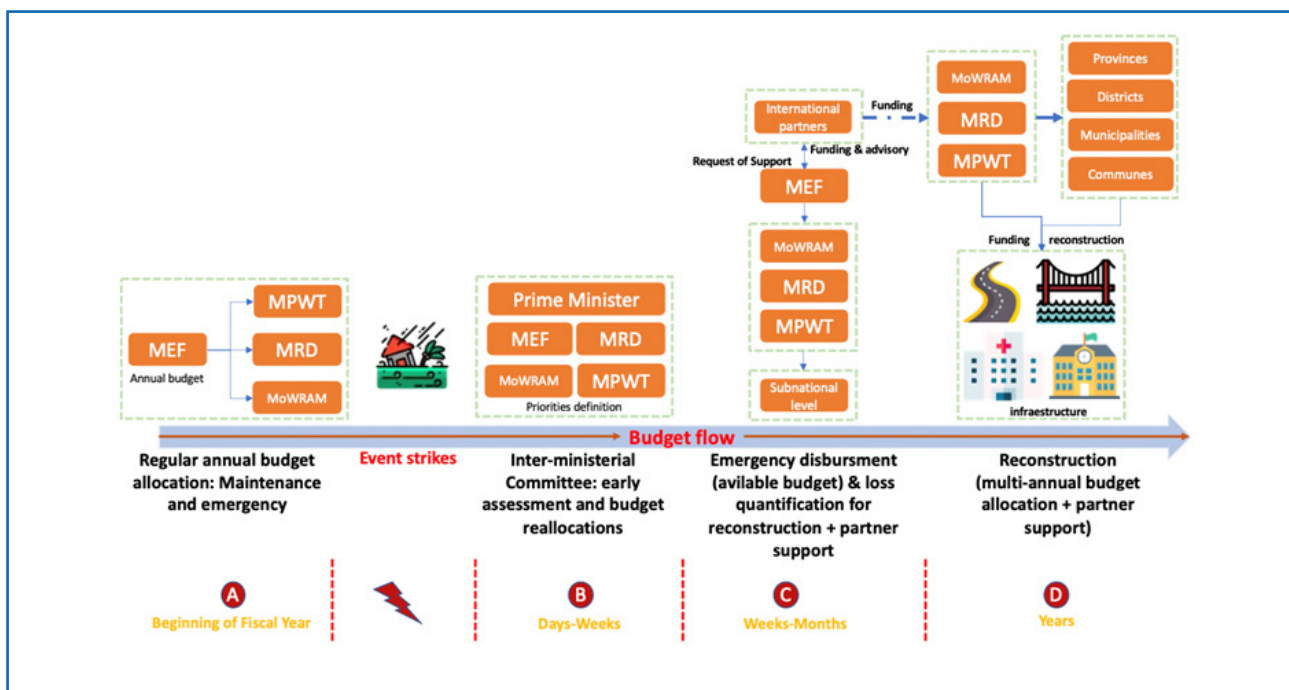


Figure 6: Recovery financing from a budget perspective for Cambodia (UNDP, 2022)

The existing financial infrastructure in Cambodia for road sector disaster recovery includes:

- **Ex ante disaster risk financing tools:** established by government in advance, and can quickly be disbursed following a disaster event
 - **Contingency budget:**
 - o Cambodia has a general contingency budget of ~US\$115 million, held by the Office of the Council of Ministers. Although less than 10% is currently estimated to be earmarked and used for disasters annually.
 - **Contingent credit:**
 - o Cambodia does not currently have a contingent credit facility, and uses the contingent credits offered by

international partners such as the World Bank, ADB, and Japan International Cooperation Agency for disaster recovery and reconstruction

- o Ex post disaster risk financing tools: sources that are identified or become available during or following a disaster

- **Budget reallocation**

- o MPWTs and MRD's maintenance budget can be reallocated for disaster recovery. Post-disaster budget reallocations can result in significant opportunity costs from foregone planned expenditures and derail progress toward national and sector development goals and objectives

- **Donor assistance**

- o The principal donors include The World Bank, Asian Development Bank, and donations from other countries such as Japan, Australia, and European countries.

- o Existing road sector reconstruction projects funded by the donor community, especially ADB¹, can be synced with the disaster recovery projects as the objectives and needs are aligned

Coordination and management of allocated funds

Rapid but transparent allocation of the funds is critical to meet the immediate recovery needs. This includes the need to establish procedures that can shorten the time of project preparation, approval, and procurement.

The key benchmarks for the financial monitoring and evaluation system are focused on:

- Funds allocated and spent from all sources
- Recovery progress
- Economic and social impacts

A review of funds allocated and recovery progress across the different segments of the road sector can identify where there are surpluses and deficits in funding.

Monitoring and evaluation of the allocated funds is part of the overall M&E for disaster recovery and is discussed as part of it under the implementation section.

Recommendations to improve the financial instruments for disaster recovery:

Currently, a separate contingency fund for disaster management does not exist and should be something to be discussed with the stakeholders. The contingency fund could collect a small piece of the regular maintenance and improvement budgetary line that could be used for DRR in case of no disasters and will reduce the chances of lack of funds post-disaster if all the allocated budget for maintenance and improvement is exhausted prior to the disruption. This establishment of a 'disaster fund' is also mandated by the Cambodian government as part of the Law on Disaster Management in 2015, stating that the governments "shall have the appropriate reserve budget and resource to be ensured for the disaster management" (Section 7, Article 39) (Kingdom of Cambodia, 2015). This presents an institutionalized opportunity for the MPWT and MRD to establish a disaster fund to support disaster management and recovery.

Donors and international assistance is a recurrent source of funding for major disasters but is unpredictable in nature. While dependency on donor assistance might not be effective all the time, the funding as and when received can be utilized to complement existing funding sources and invest in BBB. It is also possible for the Finance Committee to set up international appeals and donor conferences, which could be a good potential source of funding. Utilizing the recovery plans and their connections with the SDGs will help make a strong case for funding requests. Donor assistance can be separated into relief and recovery based on the intentions of the donors and the timeline of receiving the funds.

Tax increases are also a common instrument for funding long-term recovery needs but are currently not used by the Cambodian government. A stronger business case for tax increase can be made with the community if the funds are allocated to better their living conditions and reduce their disaster risks.

¹ADB is supporting improvement of national and rural roads through the Rural Network Improvement Project (RNIP) and Rural Roads Improvement Project (RRIP) respectively.

Road Sector Recovery Implementation Procedures

To operationalize disaster recovery, it is necessary to translate the strategic thrust and priorities into actionable projects and programs and have an implementation plan drafted to support the overall process. The right implementation plan will direct the programs and plans toward the new planned normal.

The following steps should be followed as part of recovery implementation:

- Establish reconstruction standards
- Adapt regular implementation strategies to disaster recovery context
- Establish temporary systems and immediate project prioritization
- Use procurement systems adapted to the recovery context
- Ensure government coordination and local implementation
- Ensure community engagement
- Setup monitoring and evaluation system
- Establish communication channel

Establish reconstruction standards

In the post-disaster context, the construction standards can be updated to utilize the event as an opportunity, building back better, and ensuring inclusiveness.

Take the following steps to update the reconstruction standards:

- Review the existing construction standards with resilience experts to identify gaps
- Update the safety factors and capacity guidelines for road, bridge, and culvert design to account of climate change and increasing demand
- Standardize green and cost effective mitigative solutions in reconstruction such as permeable pavement materials, living shorelines etc.
- Identify if any existing standards of reconstruction limit innovation and resilience development and make the necessary changes.

Examples of innovation in the road sector can look like alternative materials for pavements, smart pavement systems (IFAI Industry News, 2022), floating bridge in Washington (Hess, Pang, & Nelson, 2016), and the Kuala Lumpur tunnel that serves as a highway in regular days but turns into a drainage system during storm surge (Euklidiadas, 2021). Box 3 presents examples of green/nature based mitigation project examples identified by the Federal Emergency Management Authority in United States.

While the current minimum established standards by MPWT, available on the official website are dated in year 2001 (MPWT, 2001), various road improvement projects since then have recommended updates to the reconstruction standards. A 2006 study on the road network of Cambodia presents a range of road improvement projects along with the identified issues with the existing road systems (JICA, 2006). In 2011, preparing the provincial roads improvement project by ADB highlighted the updates in reconstruction standards needed for the provincial roads (KCI, 2011). For rural roads, the Rural Road Improvement Projects by MRD, supported by ADB also highlight the updates in reconstruction standards needed for rural roads in Cambodia (MRD, 2014).

One of the National Road Improvement Projects in Cambodia led by the Japan International Corporation Agency (JICA) present a comparison of the road design standards by Cambodian standards with the Asian Highway standards and presents a recommendation that can be used as starting point.

Table 1: Cambodian road design standards compared with Asian standards, and recommendations for standard updates for Cambodia as of 2014 (JICA, 2014)

Comparison of Design Speed and Criteria, and Cross-sectional Composition					
Standard	Asian Highway	Cambodian Standard		Recommended (as of 2014)	
Road Class	Class I	Rural	Urban	Rural	Urban
Design Speed	100 km/h	100km/h	50km/h	100km/h	50km/h
Min. Curve Radius (Super elevation)	360 m	415 m	90 m	350 m	80 m
Lane Width	3.5 m	3.5 m		3.5 m	
Shoulder Width	3 m	3 m	2.5 m	3 m	
Median Strip	3 m	4~12 m	2~4 m	3 m	
Cross Slope	2%	2.5~3%		2%	

In 2022, MPWT is working with Austroads to update Cambodia’s road design standards. (Partnerships for Infrastructure, 2022)These (unless a newer version is available at the time of DRF development) should be used as the baseline standard for rehabilitation.

Reviewing and updating reconstruction standards also should consider establishing inclusiveness and equity in project implementation. Establishing minimum standards for accessibility in each region with underprivileged groups will orient the project toward communities that are most vulnerable.

Limit future asset losses and reduce exposure of assets by investing in stronger protective infrastructure, such as seawalls and appropriate drainage systems, using materials that increase the resilience of transport assets or applying “softer” or “nature-based” solutions, such as beach nourishment, coral reefs protection, and mangrove preservation (GFDRR, 2018).

Some examples of enhancements that can provide protection against future disasters to the Cambodian roads include:

- Raise embankment to a level higher than the expected flood water level on the road segment
- Improve subgrade by using existing pavement as subgrade for planned new pavements, or using cement stabilization of the subgrade
- Enhance drainage along with road improvements – culverts need to be extended to fit the roads while any widening project is being undertaken, increase the capacity of the drainage facilities to meet the need of increased volumes of discharge from heavy rainfall to prevent flooding
- Adding rumble strips on road segments that might get flooded occasionally – this will allow drivers to assess road specially if the road lines visibility is hampered

Examples of ‘softer’ or ‘nature based’ solutions, that can serve as simultaneous adaptation and mitigation measures for Cambodian roads include:

- Permeable pavements
- Stormwater tree pits on roadsides
- Slope stabilization using green options such as brush mattresses, live crib walls, fascines, fencing, and staking, log terracing, and vegetated geotextiles.

These nature-based solutions have been identified specifically for the Cambodian context, as part of the 2016 project by ADB on Nature Based Solutions for Building Resilience in Towns and cities – Case Studies from the Greater Mekong Subregion.

Example of green solutions for hazard mitigation adopted in other countries include the solutions presented in Box 3, which presents the nature based hazard mitigation solutions by FEMA, the hazard management agency of the United States.

Box 3: Example individual mitigation projects by hazard type – Promoting nature based hazard mitigation through FEMA mitigation grants

Scale	Setting	Riverine/Urban Flooding	Coastal Flooding	Wildfire
Watershed / Landscape	More Urban	<ul style="list-style-type: none"> • Greenways • Culvert Upgrades • Daylighting • Low Impact Development • Stormwater Parks • Riparian Buffer • Stream/River Restoration • Horizontal Setback Levee • Floodplain Restoration • Dam Removal • Land Conservation 	<ul style="list-style-type: none"> • More Urban • Culvert Upgrades • Beach Parks • Tidal Circulation • Living Shorelines • Channel Restoration • Beaches and Dunes • Coral Reef Restoration • Coastal Wetlands Restoration (Marsh Mangwaves) • Land Conservation 	<ul style="list-style-type: none"> • Post-Fire Urban Debris Removal • Post-Fire Hazard Tree Removal • Vegetation Management • Forest Thinning • Forest Regeneration • Forest Diversification
	More Rural			
Neighborhood / Site	More Urban	<ul style="list-style-type: none"> • Green Roofs • Green Streets • Permeable Pavers • Vegetated Swales • Rain Gardens • Tree anopy • Rainwater Harvesting • Land Acquisition 	<ul style="list-style-type: none"> • Culvert Upgrades • Waterfront Parks • Stormwater Wetlands • Living Shorelines • Coastal Wetlands Restoration • Shellfish Reef Restoration 	<ul style="list-style-type: none"> • Fire- and Ignition- Resistant Roofing • Retrofit for Ignition Resistant Building Materials • Fire-Resistant Landscaping • Pruning Requirements to Reduce Fuel Loads • Post-Fire Soil Stabilization • Establishing Defensible Space
	More Rural			

Adapt existing implementation strategies to the recovery context

As recovery needs need to be completed under a lot of time constraints, the regular process of program and project implementation at MPWT and MRD might not be the right system to use. On the other hand, for the same reason of urgency, creating a new implementation system is also not the most efficient option. Hence a mixed approach is needed where the existing systems for road sector program implementation are adapted to the fast-paced timeline in a recovery context.

The aspects of implementation that need to be adapted to the recovery context include:

- Project Prioritization – prioritize based on recovery needs and asset relevance to the country's growth
- Establishing temporary systems – to support immediate relief efforts (distribution of food and medical services etc.), and to manage traffic during infrastructure reconstruction
- Establishing an exit strategy for the temporary systems
- Establish faster procurement process
- Horizontal and vertical coordination and communication – between the MPWT & MRD departments, other infrastructure sector leads, and disaster committees and external donors

The implementation plan also needs to consider interdependencies between projects, where fixing one road segment might divert the traffic to an alternate route, which may not have the capacity for the increased traffic flow. Mapping of projects and simulating changes in traffic patterns, mapped with asset vulnerability, might shed light on such project interdependencies, avoiding unintended consequences of the projects.

A transport peer review panel, including transport practitioners and academics, will help with such assessments.

During the recovery implementation phase, it is also important to establish a process of regular operations and maintenance post-recovery. The development of a proper Transport System Management and Operations (TSMO) strategy is important to ensure that the progress made with the recovery process by incorporating BBB is not reverted back due to a lack of proper maintenance of the systems.

Establish temporary systems and immediate project prioritization

Transport officials need to consider how to effectively manage traffic during the reconstruction phases and set up temporary services that replace disrupted services in the short term to mitigate economic impacts. These include

- designated detours (FHWA, 2013),
- information systems necessary to share the details of the detours with the public,
- temporary bridges for evacuation and restoring traffic (Savani, 2016).

Traffic surveys and asset-level risk analysis conducted prior to the disaster will be helpful in developing these temporary systems. It is also important at this stage to establish an exit strategy and timeline for these temporary systems.

Debris Removal and Demolition is one of the first actives needed to be completed to facilitate recovery. It is important to remove debris and identify infrastructure, including buildings that support transport, that may need to be demolished because they are beyond repair or no longer needed, or reside in a hazard zone.

Develop procurement systems adapted to the recovery context

Procurement of personnel and equipment to remove debris, repair roads and bridges, make temporary repairs to important facilities, etc., requires technical knowledge, time, and human resources. While making sure the process is aligned with the objective of building back better, it also needs to be completed under the time pressure of disaster recovery. Steps that can be taken by MRWT and MRD to facilitate a smooth, effective, and efficient procurement process include:

- Simplifying the procurement process of hiring contractors under existing contracts in the region. This easily mobilizes the existing resources for reconstruction.
- Create simple forms of contracts such as time base contracts and reimbursable cost-plus-fee contracts when the design is not yet prepared.
- MPWT and MRD can also pre-qualify contractors and pre-establish a framework agreement with the local contractors to reduce the time of procurement following a disaster.

Ensure government coordination and support local implementation

It is the role of the lead agency for recovery, in this case, MRWT & MRD, to establish and oversee the coordination mechanisms from the national level (NCDM & RGC), all the way to the local systems implementing the projects.

Coordination needs to take place vertically, i.e., between national, provincial, and local levels, and also horizontally, i.e., between NGOs, the private sector, and CSOs. This coordination process by MPWT will entail assigning different areas of recovery to governmental or nongovernmental agencies based on their areas of expertise. Various coordination mechanisms can be set up (GFDRR, 2020), including:

- **Transport Recovery Coordination Group:** The coordination group established to manage the PDNA and DRF process needs to ensure internal coordination between departments -MPWT, MRD, NCDM, and the local public works and transport departments. Aspects such as contract setup, bidding and procurement processes, design approval and material quality control need to be consistent across all internal departments.
- **Task Force/Empowered Committee.** Consisting of senior politicians, administrators, and professional experts, the task force can be set up at a high level in the government to develop a recovery policy/program. This can include officials from NCDM with previous experience in similar recovery efforts, international experts from ADB and UNDP, and political leaders who can support the process in the institutional systems. This will ensure technical expertise gaps are filled when needed with the help of ADB & UNDP, and a continuous institutional push on completion of the road improvement projects in the later stages of recovery.
- **NGOs' Coordination Committee.** NGOs can be instrumental in getting community input in the rehabilitation of the road network, ensuring equitable distribution of recovery efforts to all communities. MPWT and MRD can set up a committee at the subnational level to assist the NGOs with their participation in the recovery program. The committee also provides NGOs with the necessary support and authorization to implement community involvement exercises with the local-level project management committee.
- **Local Level Project Management Committee.** This committee can consist of local government officials, NGOs, and representatives of affected communities. The government officials in this committee (members of the provincial and communal public work and transport departments) can communicate the timeline and ensure transparency in the road rehabilitation process with the community, while the NGOs and community leaders can serve as a voice of the public to direct the recovery to the communities that are in the most need, such as access to hospitals, local shelters, food banks, and any other temporary facility needs to be prioritized. Such dynamic information can be provided by the NGO and community leads.

The recovery team needs to gather the latest contacts of the relevant stakeholders that can support the implementation process before starting the projects. The potential disaster management partners that can be part of these coordination mechanisms are discussed in box 4.

Box 4: Cambodia's Disaster Recovery Partners from the Social Sector

Partnership for Development of Kampuchea (PADEK): PADEK is a Cambodian NGO working with disadvantaged rural communities to improve their livelihoods. They can support inclusiveness in road sector recovery implementation by identifying regions that need to be prioritized to provide access to goods, services, and jobs to those that are disadvantaged.

Federation of Associations of Small and Medium Enterprises in Cambodia (FASMEC): FASMEC is a private sector network for various small and medium-sized enterprises in Cambodia. Their involvement in the local level implementation of road sector recovery will ensure that the recovery is in alignment with supporting the small and medium-size enterprises to regain their market presence by providing access to the public to these enterprises.

Joint Action Group (JAG): JAG is an informal group of civil society organizations working in Cambodia on DRR and disaster management. It includes representatives from a range of organizations and can be utilized to channel all the community and NGO outreach and coordination with government officials.

The Humanitarian Response Forum (HRF): ensures sound coordination and communication on emergency preparedness, and humanitarian response in Cambodia between the United Nations (UN), international non-governmental organizations (INGOs), and international organizations (IOs). The HRF works in close collaboration with the Government, most notably the National Committee for Disaster Management (NCDM), to facilitate a coordinated and effective approach in support of people affected by humanitarian crises.

Cambodian Humanitarian Forum (CHF): CHF is funded by USAID/OFDA, which commenced in May 2012. This project is coordinated by Asian Disaster Preparedness Center (ADPC) with in country partners NCDM and Royal University of Phnom Penh. The goal is to improve the humanitarian response to disasters in Cambodia by strengthening the leadership capacity of NGOs to better engage in the humanitarian framework by providing knowledge resources, training, and mentoring.

Ensure community participation

Communities are not only the group most affected by disasters but also a great resource in the recovery process if involved correctly by the recovery leads. Their inputs and reviews of the recovery plans and projects can shed light on the potential challenges in implementation, possible inequalities observed that might go unnoticed by the recovery team, and possible ways to enhance the projects using communities' local knowledge expertise.

Steps to ensure community participation are:

- Designate the responsibility of community engagement to the MGOs or the NGO coordination committee if established.
- Conduct community meetings to identify the pain points, such as the main facilities that the community is not able to access, what modes of transportation are needed and are not available, etc.
- Ensure participation of marginalized groups such as women, the elderly, people with disabilities, and members of certain social classes so that their accessibility needs are identified and met
- Include the community to participate in recovery, providing temporary employment opportunities if possible.

The social and economic impacts of ongoing roadworks, detours, and extended repair times can add to both economic costs (travel times, etc.) and social costs (additional stress and frustration). Engaging the affected communities in the recovery process provides them with a sense of ownership and increases trust in the system.

Set up monitoring and evaluation systems

In disaster recovery, we need a Monitoring and Evaluation Framework to ensure the programs being implemented are evaluated to gauge their effectiveness. By improving the quality of evaluations, it makes it possible to improve subsequent disaster recovery programs. The learning we obtain from these evaluations is incorporated into program design and delivery.

Establishing an M&E system involves defining what to monitor and evaluate (activities and outcomes), when to monitor and evaluate (timing and frequency), how to monitor and evaluate (tools and indicators), who will monitor and evaluate, and how to use the results. An effective M&E system for recovery should be able to:

- Track the physical progress of reconstruction activities
- Track results for other recovery activities outside the scope of reconstruction
- Provide regular and comprehensive information on the allocation and disbursement of funds (public and private)
- Provide data for evaluating the economic and social impacts of recovery programs
- Inform outcome-based mid-term review of the recovery implementation

Use the following steps to establish an M&E system for road sector recovery:

- Ask the project leads to define the expected outcomes and associated timeline for all the recovery projects
- Establish the key indicators of success – accessibility and mobility to the public
- Establish a progress review timeline based on % project completion. For projects spanning over a year, a quarterly review timeline can be established.
- Identify and use a dedicated management information system (MIS) to collect and store the monitoring and assessment information.
- Require regular submission of progress reports based on the review timeline from contractors and service suppliers implementing the activities.
- If possible, make these reports public to support trust-building with the community.

An example of the successful use of M&E in the disaster recovery process can be seen in the Community-Based Settlement Rehabilitation and Reconstruction Project (CBSRRP) in Yogyakarta, as presented in box 5 (Katich).

Box 5: M&E Case Study on Community-Based Settlement Rehabilitation and Reconstruction Project (CBSRRP) in Yogyakarta

Following the 2006 earthquake in Yogyakarta, Indonesia, the government drove recovery and reconstruction efforts through the establishment of standards and interagency coordination. Monitoring and evaluation was carried out at the village and program level, using facilitators and an electronic format for the entire process; it led to a 90 percent satisfaction level among beneficiaries.

Sample Ex Post DRM indicators assessed using the M&E system for the Community-Based settlement rehabilitation and reconstruction Project (CBsrrP) in Yogyakarta

Key Outcome Indicators

- At least 80 percent of the houses were occupied by project completion
- Beneficiaries' (men and women) stated satisfaction with reconstructed housing
- Beneficiaries' (men and women) stated satisfaction with community infrastructure.

Output Indicators

- Number of completed houses meets satisfactory seismic-resistant standards
- Number of households living in seismic-resistant, community-built permanent housing
- Percentage of target villages that have restored basic community infrastructure.

Intermediate Indicators

- Percentage of roof structures conforming to pre-agreed specifications
- Number of trained Housing Task Force teams operational in target villages
- Percentage of community surveys and group implementation plans completed
- Number of housing groups (KPs) formed in line with requirements of the guidelines
- Number of grants disbursed for housing reconstruction n Percentage of houses using legal timber
- Percentage of community settlement plans (CSPs) prepared in line with the guidelines
- Percentage of infrastructure proposals approved
- Number of emergency preparedness projects implemented
- Level of beneficiaries' (men and women) awareness of entitlements and project processes
- Number of trained Housing Task Force teams mobilized
- Number of construction training programs carried out
- Percentage of complaints resolved within three months.

Other examples of effective M&E strategies and frameworks applied for disaster management include:

- Australian National Monitoring and Evaluation Framework for Disaster Recovery Programs (NEMA, 2018): The framework outlines the overall process established for M&E, along with a comprehensive database of indicators and activities that can be used for monitoring and evaluation, along with past M&E reports to gather insights. The database is set up to be evolving over time through continuous input channels from the stakeholders and the community.
- The Greater Christchurch Earthquake Recovery (CERA, 2012) includes a Monitoring and Reporting that provides an overarching guide for monitoring activity, with specific and regular monitoring reports organized around the main outcome domains, such as the Canterbury Wellbeing Index (Community & Public Health, n.d.).
- The New Orleans Index has been published annually since Hurricane Katrina. Significantly, the community has been heavily involved in developing this index through the Greater New Orleans Data Center (Plyer, Shrinath, & Mack, 2015).
- The Relief and Information Systems for Earthquake Pakistan (RISEPAK) was developed after the 2005 Kashmir earthquake to provide information on needs and response at village scale for gap analysis from data collected by individuals in the field (RISE-PAK, 2006).
- The Tsunami Recovery Impact Assessment and Monitoring System (TRIAMS) was endorsed by the Global Consortium for Tsunami-Affected Countries (India, Indonesia, the Maldives, Sri Lanka, and Thailand) to define, promote and support the tracking of post-disaster recovery after the 2004 Indian Ocean tsunami. TRIAMS created output and outcome indicators categorized into four areas: vital needs, basic social services, infrastructure, and livelihoods (Dissanayake, 2018).

Some potential indicators that can be used in the M&E process of road sector recovery are presented below:

- Key Outcome Indicators
 - Access between all residential areas and the critical services (hospitals, banks, schools, work zones etc.) is restored
 - Communities state satisfaction with the access to their work and other critical services
 - % Paved roads is increased since before the disaster, and % unpaved and dirt road is decreased (indicating build-back-better)
 - Road infrastructure vulnerability to flooding is reduced (indicating build-back-better with mitigation efforts)
- Output Indicators
 - % Of national, provincial, and rural roads rehabilitated/reconstructed
 - % Paved, unpaved, and dirt road after recovery
 - % Bridges rehabilitated/reconstructed
 - % Other road assets restored/repared
 - % Roads with elevation below flood levels as identified by the latest flooding projections (identifying flood risk)
 - % Unpaved roads under flood risk (identifying highly vulnerable roads under flooding)
- Intermediate Indicators
 - % Community survey plans completed
 - % Projects moved up from one stage to next (contract and design process to procurement, procurement to construction etc.)
 - Number of trained officials working on the monitoring and assessment process
 - % Of road assets assessed for status evaluation
 - % Road network where a vulnerability assessment is being conducted

Establish communication strategy

An established ongoing dialogue and communication between all stakeholders of the road sector recovery process is important to establish trust and accountability in the process, to ensure everyone is in alignment with the overall vision and guiding principles and is updated with the evolving needs identified by different parts of the system.

A well-defined internal and public communications strategy recognizes the different types of stakeholders and identifies the most effective means of communicating with them.

To develop an effective communication strategy, a quick communication needs assessment should be conducted by MPWT & MRD leads. Table 2 presents the template for communication needs assessment.

Table 2: Communication Needs Assessment Template

Issue	Questions to Ask
Situational Context	<p>What is the context of the emergency?</p> <ul style="list-style-type: none"> ■ Have the road assets been completely damaged, or temporarily blocked due to the disruption? <p>How is the recovery proceeding?</p> <ul style="list-style-type: none"> ■ Have road clearing units been deployed for the temporarily blocked roads? ■ Have detour plans been developed, disseminated, and communicated with the public while the damaged roads & bridges are being repaired/rehabilitated? <p>What government and non-government actors are engaged in recovery?</p> <p>Has the disaster impacted access to essential services?</p> <ul style="list-style-type: none"> ■ If so, how is the essential services being deployed to the community? ■ Have evacuation routes shared with the emergency response team deploying the essential services? <p>Is there disaster-related violence or are there pre-existing fragility and conflict conditions?</p> <ul style="list-style-type: none"> ■ Is there access between the law enforcement and the communities with potential conflict conditions? <p>What human and financial resources does the government (national and local levels) possess to support the development and implementation of a communications plan?</p>
Audience (Stakeholders)	<p>Who is the audience (include the range of different stakeholders)?</p> <ul style="list-style-type: none"> ■ What communities have lost accessibility due to road closures? <p>What are their specific needs?</p> <p>What communications channels and processes already exist that can be used?</p> <p>What are the issues/problems confronting the audience? Are there existing geographic, cultural, socioeconomic, political barriers to engaging with the audience?</p>
Objectives	<p>What is to be achieved by communicating?</p> <p>What information should be communicated?</p> <ul style="list-style-type: none"> ■ Detour plans ■ Timelines of repair and rehabilitation of major roads ■ Public transport updates
Communication Methods	<p>What communication methods are best suited to the audience, and what is to be achieved?</p>
Feedback	<p>What strategies or actions can be deployed to ensure community views and opinions (positive and negative) are fed back into the recovery process?</p> <p>Are there existing grievance mechanisms that can be built upon?</p>

Key principles of an effective internal communication strategy are to contribute to the transparency of recovery, build credibility and consensus on recovery goals, and identify coverage gaps and project overlaps. MPWT and MRD should be taking the lead in setting up an internal communication strategy for the road sector PDNA communication.

The following steps should be taken to support communication with the recovery team and donors:

- MPWT & MRD leads should schedule monthly decision meetings with international partners in which the recovery objectives of the government, private sector, and civil society are communicated. Such meetings will conserve the time of senior government officials, enabling them to stay focused on meeting their respective recovery milestones and objectives.
- For internal communication within the group of stakeholders directly involved in the recovery process, develop a dedicated internal information-sharing website. The website should include access to all contacts, disaster databases, and summaries of any discussion between the stakeholders. It can also be used to channel communication efforts such as webinars and discussion boards.

Speaking with and mapping plans with planners, implementers, and community groups will strengthen transparency, minimize duplication of effort, highlight gaps in assistance, and build consensus for achieving common recovery goals. Internal communication creates a space for exchange and feedback among all involved. This communication also can serve as one mechanism by which to redress grievances.

An effective public communications strategy can raise awareness of the recovery effort among the general public, both national and international, particularly in donor countries. The strategy should define the key communications for broadcast, print, and social media. These messages are intended to inform public expectations about the scope and timeframe of the recovery.

For effective public communication, the following actions should be taken:

- Identify a public information officer who will schedule interviews, issue press releases, and gather and verify the information.
- Provide relevant information to the public such that they can take actions to better protect themselves and their communities from disaster impacts. These include routes that are available and will soon become available, detours, and plans for the transport network going forward.
- Create feedback mechanisms that allows public to be engaged, identify new opportunities, raise issues or grievances, identify corruption, and propose alternatives for transport reconstruction investments and programs.
- Utilize shared databases, message boards, and satellite links to improve information flow.
- Identify multiple ways of sharing information such that the information reaches the maximum number of people. The various potential ways of communication are (GFDRR):
 - o Community meetings
 - o Newspaper
 - o Radio
 - o Notice Boards
 - o Websites
 - o Television
 - o Mobile phones (SMS/text message)
 - o Social media (Facebook, Twitter, Blogs etc.)
 - o Word of mouth

By recognizing visible signs of early physical recovery and announcing longer term goals, an effective public communication strategy can keep the entire recovery community and general public galvanized for subsequent phases of recovery and reconstruction.

Dynamic Learning

With every DRF being developed after a disaster, and its implementation for disaster recovery, the experience will lead to learnings identified by the stakeholders involved. This Disaster Recovery guidebook should be periodically revised based on the learnings from experiences. This can include a dynamic repository of effective practices and the removal of guidance elements that might go obsolete with changes in the institutional systems of the road sector of Cambodia.

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