**SECTORAL GUIDANCE ON MAINSTREAMING DRR IN FLOOD RECOVERY**

At least 1.6 million people, including 550,000 children, have been displaced by flooding and landslides across Myanmar over the course of July and August. Many communities remain unreachable as a result of obstructed or collapsed roads and bridges. School and health, water and sanitation facilities continue to need to be rebuilt and rehabilitated to re-establish access to basic services. Flash floods have again affected areas in Chin, Sagaing, and Kachin, with risks to vulnerable communities continuing until the monsoon season ends in mid-October, compounded by the cyclone season with highest probability of storms in October. The ongoing Government-led Damage and Needs assessment will likely increase the number of people who have been affected by the floods through the incorporation of direct and indirect impacts on livelihoods and markets.

Disaster risk reduction is a core component of recovery planning. The need to avoid rebuilding the vulnerabilities that led to the disaster in the first place is at the heart of the concept of “building back better”. These short guidelines were put together by the DRR WG to support sectors and clusters in their effort to mainstream DRR in ongoing flood response and recovery processes. They provide a summary of recognized literature with a focus on practical examples that relate specifically to the recovery phase and to floods and landslides. Full references are provided under each technical chapter for additional information.

**Key DRR terminology**

**Disaster risk reduction**

The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

**Prevention**

The outright avoidance of adverse impacts of hazards and related disasters through action taken in advance. Examples include dams or embankments that eliminate flood risks, land-use regulations that do not permit any settlement in high risk zones, and seismic engineering designs that ensure the survival and function of a critical building in any likely earthquake.

**Mitigation**

The lessening or limitation of the adverse impacts of hazards and related disasters.   
The adverse impacts of hazards often cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions. Mitigation measures encompass engineering techniques and hazard-resistant construction as well as improved environmental policies and public awareness.

**Preparedness**

The knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to, and recover from, the impacts of likely, imminent or current hazard events or conditions.

**WATER, SANITATION AND HYGIENE (WASH)**

**Goal and Objectives of DRR mainstreaming in WASH recovery programming**

Identifying, managing and minimizing disaster risks offers benefits to long-term WASH program performance by decreasing the sensitivity of the WASH sector to climatic uncertainty. Specifically, the mainstreaming of DRR in WASH recovery programming has the following objectives:

* Reduce the potential impact of hazard events on WASH services (mitigation)
* Ensure the design of the new or adapted systems addresses earlier vulnerabilities (build back better)
* Ensure WASH services have minimal negative effects on society and the environment (do no harm)

Overall, the mainstreaming of DRR in WASH recovery and development programming follows three approaches:

* Reduction in the likelihood that individuals feel the effects of disasters. This can be achieved through programming that seeks to both understand the determinants of disaster risk exposure to WASH services and act on them to minimize the exposure of individuals.
* Strengthening the reliability of WASH services, also called disaster-proofing of WASH infrastructures.
* Strengthening capacities of governments and communities to increase disaster resilience over time. This can be achieved by helping governments design, deliver and sustain investments in WASH services that consider the additional risks posed by disasters and climate change, as well as by strengthening multi-level WASH governance, strategies/plans and systems as well as building the adaptive capacity of communities to deal with shocks.

**Examples of measures that support the mainstreaming of DRR in WASH recovery programming**

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| **Phase** | **Scope of action** | **Specific WASH examples** |
| Recovery and reconstruction | Mitigation and prevention | **Risk likelihood reduction:** installation of dikes and levees, gully protection and rehabilitation, construction of flood water drainage systems, multi-purpose reservoirs and sand storage dams, reforestation of hills at risk of landslides  **Risk Consequence reduction:** enlargement of drainage channels, selection of safe location for (re)construction, flood resistant WASH infrastructures (improving resilience of wells and ponds, raised pit latrines; sceptic tanks), hygiene promotion and public awareness, risk-informed water safety planning, small-scale biological systems, rainwater harvesting technologies and water conservation, participatory water quality testing  **Risk avoidance:** adequate land use planning and management, relocation of HH and WASH facilities |
| Preparedness | **Early warning systems**  **Preparation for WASH response:** contingency planning, formation of WASH response teams, capacity-building of Government counterparts, prepositioning of WASH supplies, WASH-related public awareness  **Preparation for recovery:** capacity building in WASH damage assessment, capacity building in resilient reconstruction methods, preparation for disposal of debris, prepositioning of reconstruction materials |
| Enabling environment | Systematic risk assessments prior to WASH interventions  WASH coordination platforms at national and local levels  Integration of DRR issues in WASH strategies and plans  Promotion of integrated water resource management |

*Adapted from Global WASH cluster, DRR and WASH Comprehensive Guidance and UNICEF and GWP, WASH Climate Resilient Development, Strategic Framework.*

**Hazard-specific guidance**

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| **Landslides** | **Infrastructures**  Location: identify and map risk areas; avoid spots in unconsolidated soils in inclined terrain, or points below deforested areas; avoid areas close to natural drainage channels; install structures on soils with adequate load-bearing capacity; choose an accessible location; relocate services that are at risk of mass movement  Materials: use materials that resist to some extent the effects of mass movements e.g. resistant pipe materials, in some places, flexible piping may be more adequate; use high strength quality components  Construction: construct, install so as to resist the effects of landslides, e.g. bridge pipes over zones at risk or lay pipes in solid rock; install pipe anchors in solid soil close to areas at risk; backfill and compact trenches; minimise the risks of blockage of intakes and overflows to artificial reservoirs  Consolidation of risk areas: encourage reforestation; build retention structures like rentation walls or gabion structures to consolidate the soils; use terracing |
| **Inputs**  Design water supply systems so there is capacity to deal with changes in water quality and identify reliable alternafive sources of water |
| **Floods** | **Infrastructures**  Location: identify and map risk areas; avoild low-lying areas and natural drainage paths and channels; avoid unconsolidated soils; avoid coastlines or river banks; install structures on soils with adequate load-bearing capacity; choose an accessible location; relocate services that are at risk of flooding or other secondary hazards  Materials: use materials that resist the effects of flooding and erosion, e.g. concerete structures with solid foundations; chosse materials with high strength and high quality components  Construction: construct/install so that structures resist the effects of flooding, e.g. bridge pipes over natural drainage channels; install pipe anchors in solid soil; build covers for wells, reservoirs, tanks and visit chambers; reinforce wells and ponds; rise structures of at least 0.3 m above the maximum flood level; put electrical installations well above maximum flood level; maintain 24/24 pressure in water distribution systems to avoid entrance of contaminated water or solids; ensure presence of proper sanitary seal in wells and boreholes; place intake structures where they cannot be affected by floating debris; reinforce and brace reservoirs; install swewer backflow valves; make round pit latrines to reduce risk of collapse; line latrine pits; in unconsolidated soils, install a slab round the latrine pit |
| **Inputs**  Design water supply systems so there is capacity to deal with changes in water quality and identify reliable alternafive sources of water |

**Reference documents**

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**EDUCATION**



**Goal and Objectives of DRR mainstreaming in education recovery programming**

The overall goal of mainstreaming DRR in or implementing a comprehensive school safety approach to disaster education recovery planning is to protect the lives of children and education personnel as well as to safeguard sector achievements and investments. Specifically, it serves the 3 following objectives, extracted from the Comprehensive School Safety Framework:

* To protect learners and education workers from death, injury and harm in schools;
* To plan for educational continuity in the face of expected hazards;
* To safeguard education sector investments;
* To strengthen climate-smart disaster resilience through education.

There are three recognized approaches to comprehensive school safety, which are widely accepted by the international community and an increasing number of Governments:

* Safe learning facilities involves education authorities, planners, architects, engineers, builders, and school community members in safe site selection, design, construction and maintenance (mitigation).
* School Disaster Management is established via national and sub-national education authorities and local school communities (including children and parents), working in collaboration with their disaster management counterparts at each jurisdiction, in order to maintain safe learning environments and plan for educational continuity, conforming to international standards (preparedness)
* Risk Reduction and Resilience Education is designed to develop a culture of safety (enabling environment)

**Examples of measures that support the mainstreaming of DRR in WASH recovery programming**

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| **Phase** | **Scope of action** | **Specific education examples** |
| Recovery and reconstruction | Mitigation or Safe learning facilities | * Select safe school sites and implement disaster-resilient design and construction to make every new school a safe school * Implement prioritization schema for retrofit and replacement (including relocation of unsafe schools) * Minimize structural, non-structural and infrastructural risks to make buildings and facilities for survival and evacuation. * Incorporate access and safety for people with disabilities in design and construction of school facilities. * If schools are planned as temporary community shelters, design them to meet these needs, and be sure to plan for suitable alternate facilities for educational continuity. * Ensure that children’s access to schools is free from physical risks (e.g. pedestrian paths, road and river crossings). * Adapt water and sanitation facilities to potential risks (e.g. rain-fed and lined latrines). * Implement climate-smart interventions to enhance water, energy and food security (e.g. rainwater harvesting, solar panels, renewable energy, and school gardens). * Plan for continuous monitoring, financing, and oversight for ongoing facilities maintenance and safety. |
|  | Preparedness or school disaster management | * Provide guidance at sub-national and school-site levels for ongoing site-based assessment and response preparedness as part of normal school management and improvement. * Empower school committees to lead identification and mapping of all hazards inside and outside school and community and action-planning for preparedness activities. Encourage participation of staff, students, parents and community stakeholders in this work. * Adapt standard operating procedures as needed, for hazards with and without warnings, including: drop cover and hold, building evacuation, evacuation to safe haven, shelter-in-place and lockdown, and safe family reunification. * Engage schools in making early warning and early action systems meaningful and effective. * Establish national and sub-national contingency plans, based on the Interagency Network for Education in Emergencies (INEE) Minimum Standards (2010), to support educational continuity, including plans and criteria to limit the temporary use of schools as temporary shelters * Identify alternate locations for temporary learning spaces and alternate modes of instruction. * Practice, critically evaluate, and improve on response preparedness, with regular school-wide and community-linked simulation drills. Adapt standard operating procedures to specific context of each school. |
|  | Enabling environment or DRR and Resilience education | * Develop consensus-based key messages for reducing household and community vulnerabilities, and for preparing for and responding to hazard impacts as a foundation for formal and non-formal education. * Develop scope and sequence for teaching about critical thinking for all hazards. * Infuse risk reduction throughout the curriculum and provide guidelines for integration of risk reduction and resilience into carrier subjects. * Develop quality teaching and learning materials for students and teachers. * Provide teacher training for both teachers and teacher trainees on risk reduction curriculum materials and methodologies. |

**Reference documents**

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UNISDR (2012), Assessing School Safety from Disasters, A Global Baseline, <http://www.unisdr.org/files/35274_2012schoolsafetyglobalbaseline.pdf>

The World Bank (2014), Learning from Mega Disasters, <https://openknowledge.worldbank.org/handle/10986/18864>

**NUTRITION AND FOOD SECURITY**

**Goal and Objectives of DRR mainstreaming in Food and Nutrition Security recovery programming**

Disasters exacerbate malnutrition. Whilst in a disaster everybody can be at risk of malnutrition, infants, young children, and pregnant and lactating women are particularly vulnerable. The goal of mainstreaming DRR in nutrition and food security is to protect development investments in the agriculture, livestock, fisheries/aquaculture and forestry sectors, thereby helping the world’s most vulnerable people become food secure.

There are four recognized approaches to mainstreaming DRR in food and nutrition security (FAO):

* Enabling environment: institutional strengthening and good governance for DRR in agricultural sectors
* Watch to safeguard: information and early warning systems on food and nutrition security
* Prevention and mitigation: promotion and diversification of livelihoods with risk reducing technologies, approaches and practices across all agricultural sectors.
* Preparedness: preparedness for effective response and recovery across all agricultural sectors



**Examples of measures that support the mainstreaming of DRR in Food and Nutrition Security**

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| **Scope of action** | **Specific food and nutrition security examples** |
| Enabling environment | * Risk-informed policies and institutional frameworks for food and nutrition security in agriculture, livestock, fisheries/aquaculture, forestry and natural resource management; * Strengthening of the institutional capacities to implement policies and frameworks. |
| Watch to safeguard | * Strengthen and harmonize food and nutrition security information and early warning systems to better monitor the multiple threats and inform decision-making; * Establish and strengthen ongoing nutrition assessment/ surveillance mechanism. |
| Prevention and mitigation | * Improve management of crop species and varieties; * Promote crops and varieties that are more resilient to floods or drought and adapted to new climate patterns, * Develop efficient seed delivery systems for improving farmers’ access to adequate varieties, * Promote sustainable water management to increase water use efficiency and productivity, such as rainwater harvesting, water storage and conservation techniques and irrigation efficiency; * Promote agro-forestry systems that make use of trees and shrubs as shelterbelts, windbreaks and live fences to diminish the effects of extreme weather events; * Promote conservation agriculture which uses minimal soil disturbance, permanent soil cover and crop rotations, thereby contributing to crop diversification, high water infiltration for reduced surface runoff and soil erosion, among other benefits; * Promote natural resource management practices to restore degraded grasslands through grazing management, re-vegetation and supplementing poor quality forages with fodder trees, as in agro-silvo-pastoral systems and land tenure to secure land rights. |
| Preparedness | * Reduce vulnerability through promoting improved care practices (such as exclusive breast-feeding and appropriate complementary feeding) and protect nutritional status in hazard prone areas; * Strengthen community health systems for early diagnosis, referrals and follow-up of cases with acute malnutrition; * Link nutrition actors and services to disaster early warning systems at national, sub-national and community level; * Preposition stocks (regional and national hubs) for identified ‘at risk’ populations; * Scale up communication for change behaviours in vulnerable communities; * Strengthen coordination of humanitarian and development actors at all levels; * At the community level, promote appropriate technologies and practices, such as seed and grazing reserves, safe storage facilities for seeds and harvest, livestock shelters and safe and hygienic food preparation practices. |

**Reference documents**

FAO (2013), Resilient Livelihoods, DRR for Food and Nutrition Security, <http://www.fao.org/docrep/015/i2540e/i2540e00.pdf>

UNISDR (2011), DRM for Health: Nutrition, <http://www.unisdr.org/we/inform/publications/19984>

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