

Enhancing Institutional Capacities in Disaster Risk Management for Food Security in the D.P.R Korea

A Roadmap

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DRAFT

Executive Summary

The Democratic People's Republic of Korea (DPRK) is recurrently exposed to natural hazards which threaten the national food security by causing severe damage and loss to the cropping, livestock, fishing and forestry sectors.

In the recent years, key milestones to proactively address disaster risk were set with the promulgation the *DPRK Law on Disaster Prevention, Rescue and Rehabilitation*, the establishment of the State Committee for Emergency and Disaster Management and the specialized Department of Disaster Management in key line Ministries. Yet, the priority is given to further strengthen institutional capacities for the design and implementation of the disaster management system at all levels, including areas of prevention, mitigation, preparedness, response and recovery.

Responding to this demand the project “Consolidating capacities for disaster risk reduction (DRR) in Agriculture in South East Asia (Cambodia, Lao PDR, Philippines, DPRK)” was developed in 2014- funded by European Union Humanitarian Aid and Civil Protection Department (ECHO) and with technical leadership and assistance provided by the Food and Agriculture Organization (FAO) of the United Nations. The objective of the project component in the DPRK is to raise the awareness on DRR and on core technical and institutional requirements of key stakeholders in the agriculture sectors. This includes conducting a capacity needs assessment, providing awareness raising training seminars for key DRM stakeholder and for farmer cooperatives on good practices through the organization of field days in five selected provinces.

As the DPRK’s most important goal is to enhance national food security and the well-being of its people, this capacity needs assessment gives special emphasis to agriculture (cropping, irrigation and livestock), considered as the key sector for the national food security and at the same time the most affected sector by natural hazards. However, the importance of sustainable natural resource management, in particular forests and water resources, as well as fisheries and aquaculture are seen as crucial to achieve the goal of food security, while also overcoming challenges of malnutrition and environmental degradation.

The following report summarizes key findings of the consultation process held at national level on assessing the existing strengths and current needs to prevent, mitigate and prepare for natural hazards. Based on this assessment the concerned stakeholder identified priority actions to enhance their capacities for disaster risk management in agriculture and related sectors with the intention to contribute to the national goal of food security.

List of Acronyms

AAS	Academy of Agricultural Sciences
CCA	Climate Change Adaptation
CBDRM	Community-based Disaster Risk Management
CBS	Central Bureau for Statistics
DDM	Department of Disaster Management
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
ECHO	European Union Humanitarian Aid and Civil Protection Department
FAO	Food and Agriculture Organization of the United Nations
IPCC AR5	Intergovernmental Panel on Climate Change, Fifth Assessment Report
MoA	Ministry of Agriculture
MoFI	Ministry of Fisheries
MoFR	Ministry of Forestry
MoLEP	Ministry of Land and Environmental Protection
SCEDM	State Committee on Emergencies and Disaster Management
UNISDR	United Nations International Strategy for Disaster Risk

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DRAFT

1. Introduction

This chapter provides a brief overview of the agricultural and natural hazard profile of the DPRK and the project objective and activities that have led to the development of the capacity needs assessment report.

The Democratic People's Republic of Korea (DPRK) is situated in the Korean Peninsula of the Asiatic Continent with a total population of 24,625,000¹ in 2012.

The country has nine provinces: Ryanggang, North Hamgyong, South Hamgyong, Gangwon, Jagang, North Pyongan, South Pyongan, North Hwanghae and South Hwanghae. Provinces are further divided into 210 cities (districts) and counties. Counties consist of geographical units divided in ri-s (gu- and dong-), while cities (districts) consist of dong-s. The nation's capital is Pyongyang, the largest city with approximately 3.26 million people.²

The DPRK has a rich natural resources base and a diversity of ecosystems including forests, wetlands, river systems and marine areas that provide habitat for an abundance of different species. The country's topography is characterized by mountains and hills, which account for almost 80 percent of its territory. Out of the total land area (123,138 km²) forests cover about 73.4 percent, agricultural production 15.4 percent, aquatic resources 6.2 percent and residential areas and industrial area and other land use between 1- to 1.5 percent.³

The importance of the agriculture sector

Agriculture (including forestry and fisheries) accounts for the largest portion of the Gross National Production, although the growth of agriculture is inconsistent in recent years. The arable land is limited by the country's topography, which increases the pressure to exploit its potential wherever possible. The total arable land area is estimated at about 18,956 km² (2013), out of which approximately more than 14,000 km² are occupied for cereal cultivation, including 5630 km² for paddy fields, 5310 km² for maize, and 950 km² for wheat and barley production. Another 1450 km² are under fruit orchards, and the remaining agriculture land area accounts for vegetable

¹ Source: A National Strategic Action Plan for the Food Crop Genetic Resources Management to Adapt to Climate Change in the Democratic People's Republic of Korea. 2012. Data is based on Pyongyang: DPRK Central Bureau of Statistics. 2009. Retrieved 19 February 2011.

² Source: Ministry of Land and Environment Protection, Democratic People's Republic of Korea. Environment And Climate Change Outlook. 2012.

³ Source: Data provided by MoA, 2015; and A National Strategic Action Plan for the Food Crop Genetic Resources Management to Adapt to Climate Change in the Democratic People's Republic of Korea. 2012

crops and industrial crops such as mulberry, cotton and tobacco. The arable land per-person is less than 0.1 ha.⁴

The DPRK has a temperate climate with four seasons. As the country is located between the Pacific Ocean and the Asiatic Continent, it shows both, continental and oceanic climate characteristics. The average annual temperature ranges from 8 to 12 °C, with an average of 24 °C from June to August and -5.5 °C in November to December. Spring and autumn are marked by mild temperatures and variable winds. Summers are hot and humid affected by southern and south-eastern monsoon winds that bring moist air from the Pacific Ocean. The annual average precipitation is between 1,000- 1,200 mm and varies by region. 60 percent of all precipitation occurs from June to September, while the distribution of the remaining 40 percent of precipitation is less reliable. Winters are long and dry as a result of northern and north-western winds that blow from Siberia. This allows only single cropping system in the Northern provinces of the country. In the south, where winters are slightly shorter and milder, double-cropping is possible.

The agro-ecosystem of the DPRK is divided into 7 zones, 53 regions or 1082 cells (530 cells for paddy fields and 552 cells for non-paddy field).

Table 1: Agro-ecosystem zones DPRK⁵

Zones	Characteristics
1.	West coastline areas north of Mt. Suyang with high average annual temperature and big diurnal temperature difference,
2.	West coastline areas south of Mt.Suyang with high average annual temperature and small diurnal temperature difference
3.	Flat areas in the southern part of east coastal region with small diurnal temp. diff. and low sunshine rate in July and August.
4.	Middle mountainous areas with high rainfall
5.	Cold-prone areas in the northern part of east coastal region with low sunshine rate and low rainfall
6.	Northern inland areas with high diurnal temperature difference and high level of total radiation
7.	Northern highlands with low temperature and rainfall

⁴ Source: Rounded figures, MoA 2012/13.

⁵ Source: A National Strategic Action Plan for the Food Crop Genetic Resources Management to Adapt to Climate Change in the Democratic People's Republic of Korea. 2012. Data is based on Pyongyang: DPRK Central Bureau of Statistics. 2009. Retrieved 19 February 2011.

Natural hazards affecting the agriculture sector

Due to the shortage of agricultural input accompanied by high exposure to natural hazards, the food production is still not in a position to meet the national demand, threatening people's livelihoods and the national economy as a whole. The range of natural hazards that have an impact on food security in the DPRK include frost, hails and droughts in late spring, which are often followed by severe flooding, soil erosion in mountain areas, waterlogging, tidal waves and salinity along the coastal line. Typhoons affect the peninsula on an average of at least once every summer or early autumn.

Among these hazards, flooding has been identified as the most severe risk for the agriculture sectors in the DPRK. Major floods and combined landslides due to heavy rains occurred in 1990, 1995, 1996, 2007, 2010 and 2011.⁶ Floods have led to damages and losses to the cropping sectors in particular, but also to livestock, especially in valleys, pastures close to water reservoirs and rivers, having caused death, the spread of diseases and stress to animals. Flooding has also become a main cause for damages to water management systems such as pumping systems, dikes or small dams. Records on loss and damages show the impact of flood on agriculture production. The floods experienced in 1995/96 have caused damage and loss of 1.3 million ha of agricultural lands by inundation and sedimentation.⁷ During the flooding from August 18 to 25 in 2007, some 150 counties of nine provinces were severely affected: casualties of 6,300 were reported, 240,000 houses were damaged, 268,784 ha crop fields flooded, buried and lost. Again in 2010, floods damaged or destroyed about 3400 houses, farmland of 14,847 ha as well as roads of 726 km, 30 dams and 13 irrigation channels. More recently, acreages of the flood-damaged crop fields amounted 122,761.8 ha⁸ in 2012 and 31,872.4 ha⁹ in 2013.¹⁰

Floods are often accompanied by strong winds and typhoons, intensifying risks of water-logging during the rainy season in July and August, causing for instance in the maize production root rot and leaf blight. Typhoons and storms often also trigger high tidal waves, which increase the salt intrusion into coastal farming systems. Floods and related landslides are also - together with forest fires - among the major risk in forestry industry by damaging production facilities (logging, railways, bridges, vehicles) and rafters' villages.

⁶ Source: A National Strategic Action Plan for the Food Crop Genetic Resources Management to Adapt to Climate Change in the Democratic People's Republic of Korea. 2012

⁷ Source: National Action Plan to combat Desertification/Land degradation in Democratic People's Republic of Korea (2006-2010).

⁸ Out of which: submerged 62,712.7 ha; buried 7,845.2 ha; Lodged 48,636.4 ha; cut-out 3,567.5 ha.

⁹ Out of which: submerged 28,309.9 ha; buried 1,970.1 ha; Lodged 1,045 ha; cut-out 547.4ha.

¹⁰ Source: Data provided by MoA, 2015.

The second category of most of severe hazards that affect the agricultural sectors are drought, dry spells and late onset of rain particularly in the last two years during the period from March and June. Frequent dry periods in spring have been recorded already between 1998 and 2001. Long-lasting droughts (up to more than 30 days), however, have occurred in May and June in the past few years which have caused serious losses to maize, potato, wheat and barley production. In 2014, drought damaged crops fields accounted in total 124,120 ha, out of which 72,364 are paddy fields and 51,756 ha non-paddy cultivation.¹¹

The increase of extreme weather events in the past years is assumed to be caused by climate change. The average annual temperature in the DPRK rose by 1.9 °C in the last 100 years (1918 to 2000), which is two times as high as that of global average rise (about 0.89°C [0.69 to 1.08] over the period 1901–2012 according to IPCC AR5). Annual precipitation showed a gradual increase in the last 5 years combined with huge variations in its seasonal and regional distribution and intensity.

The project background

Under regional ECHO funded project “Consolidating capacities for disaster risk reduction (DRR) in Agriculture in South East Asia”, FAO provides technical assistance to Cambodia, Lao PDR, Philippines, and the DPRK to strengthen national capacities for DRR in agriculture. The main result of the project component in the DPRK is to raise the awareness on DRR in agriculture and on core technical and institutional requirements. Three activities have been targeted to achieve this result.

- (1) Conduct a capacity needs assessment for DRR in agriculture by assessing the levels and types of technical capacities, current gaps and priority needs.
- (2) Provide awareness raising training seminars for key stakeholder in DRM.
- (3) Raise the awareness of farmer cooperatives on disaster risks and good practice options through field days in the five target provinces. This includes field days for farmers on the presentation of risk factors and examples of proven good practice options for DRR in agriculture.

This report relates to activity one¹² and is based on several consultation meetings with representative engaged in disaster management, namely the Ministry of Agriculture (MoA), Ministry of Forestry (MoFR), Ministry of Land and Environmental Protection (MoLEP), Ministry of Fisheries (MoFI), Academy of Agriculture Science (AAS), State Committee on Emergencies and Disaster Management (SCEDM) and the Central Bureau for Statistics (CBS).

¹¹ Source: Data provided by MoA, 2015.

¹² Including findings from group discussions of awareness raising training days at national level as part of project activity two.

2. Existing institutional arrangements and ongoing activities for disaster risk management

This chapter outlines the current disaster management system, key institutions and their mandates, existing policies, planning frameworks as well as selected assessment findings on ongoing activities that relate to disaster risk management (DRM).

2.1. The overall institutional structure for disaster risk management in the DPRK

The State Committee on Emergencies and Disaster Management

A Bureau for Disaster Management was created in 2013 under the State Planning Committee. At the same time Departments for Disaster Management¹³ (DDM) have been established in each concerned line Ministry in support of the Bureau.

On 27 June 2014 a DPRK Law on Disaster Prevention, Rescue and Rehabilitation, issued by the decree No 76 of Permanent Committee of Supreme People's Assembly, was promulgated. It consists of 63 articles and 6 chapters¹⁴ covering different administrative and technical components of DRM.¹⁵ The Law has also led the adjustment of the administrative structure for DRM. A permanent governmental agency responsible for disaster management has been set up on 13 November 2014. The Bureau for Disaster Management was integrated in the State Committee on Emergencies and Disaster Management (SCDEM), which since then took the lead in overlooking the DRM system at national level.¹⁶ Its main mandate is to provide

¹³ In the DPRK the term disaster management is used for titles of key institutions whose mandates cover, however, prevention, preparedness and recovery. The national terminology in Korean has not been completely defined and agreed yet. It is planned to hold a national conference to fully agree and ensure common understanding of the terminology. In this report the term Disaster Risk Management (DRM) refers to institutional, legal, policy frameworks and administrative mechanisms and procedures related to the management of both risk (ex-ante) and disasters (ex-post) and includes, from a management perspective, prevention, mitigation, preparedness as well as response, recovery and rehabilitation. However, the main focus of the assessment was given to capacities, programs, actions targeted to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards.

¹⁴ Chapter 1: Fundamentals of the Law; Chapter 2: Planning for Disaster Risk Reduction; Chapter 3: Observation of Disaster-Causing Natural Phenomena and Early-Warning; Chapter 4: Preparation and Supply of Resources for Disaster Management; Chapter 5: Response to and recovery from Disasters; Chapter 6: Guidance and Control of Disaster Management.

¹⁵ However, natural disasters have also been recognized in the DPRK Law on Agriculture which was adopted on December 18, 1998 in Decree No. 290 of Standing Committee of Supreme People's Assembly. It covers the provisions on the diversified development of agriculture, including the protection of agricultural lands against natural disasters and on the prevention of land degradation.

¹⁶ Visualisation in chart on page 14.

guidance, to coordinate and control disaster management across all sectors and line ministries. The main responsibilities of the SCEDM cover:

- Disaster Risk Reduction (DRR), which include the regular survey and control of various disaster risk, guidance of planning for DRR, supervision for implementation of DRR plans, and provision of material and technical conditions for DRR.
- Disaster Risk Preparedness, including the guidance on planning for disaster preparedness and response, inspection and control of preparedness activities, supervision of evacuation, rescue, and relief activities, supervision of preparation, storage and distribution of disaster response materials.
- Primary Recovery, including survey of damage, assessment of needs for primary recovery, guidance on planning for primary recovery, preparation, storage and supply of materials as well as inspection and control of primary recovery.
- Consolidation of scientific and technological basis for disaster management by consolidating and analysing disaster related data for the improvement of national disaster management, application and extension of global best practices and knowledge on disaster management, and the innovation of local approaches through practice.

In total eight departments are established under the committee: The Department of Survey and Assessment, of Administration, of Planning, of Risk Management, of Finance, of Contingency Control; of Storage and Supplies; External Cooperation and of Inspection. A First-Stage Action Plan has already been developed and identifies immediate tasks to be initiated by the SCEDM:

- The formulation of a National Disaster Management Strategy encompassing prevention, mitigation, preparedness, response and primary recovery.
- The development and application for technical tools for disaster management
 - Methodologies for disaster risk assessment; preparedness and response assessment and for a primary recovery needs assessment.
 - The adoption of a DPRK specific Multi-Cluster/Sector Initial Rapid Assessment (MIRA) tool.

Sectoral and regional administrative organs for disaster management have been established under SCEDM. At national level this refers to the DDMs/focal points in each of line Ministries. The directors of the DDMs the SCEDM meet every 6 months to align sectoral planning and exchange information. At sub-national level disaster management focal points/and departments have been established under the provincial and county people's committees. Under the jurisdiction of the Ministry of Agriculture (MoA), unlike the other line ministries, there are provincial rural management committees and county cooperative farm management committees, each of which has its own DDM or responsible officer.¹⁷

¹⁷ For visualization see chart on page 14.

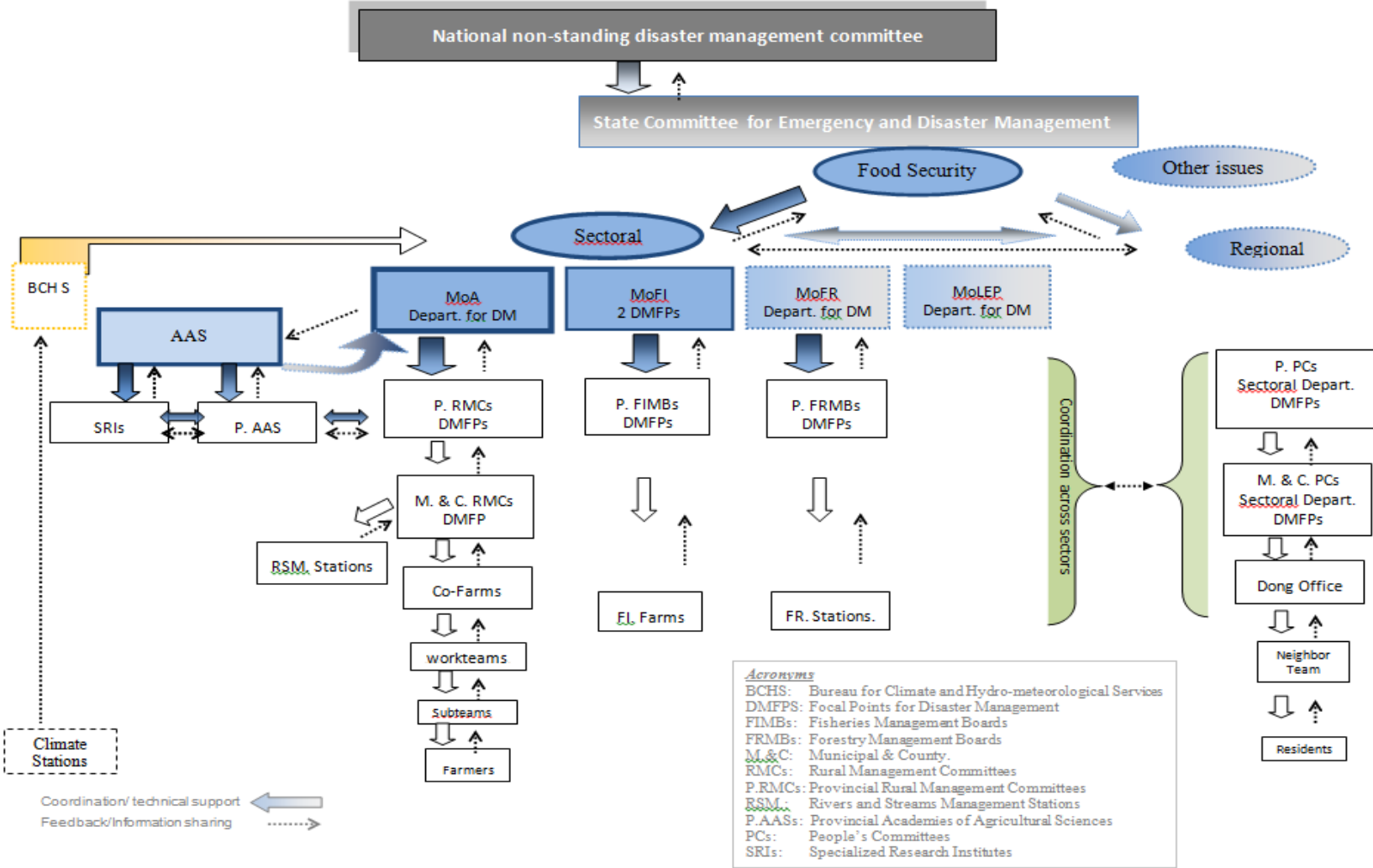
Climate and weather information systems

The National Bureau for Climate and Hydro-Meteorological Services has the overall mandate of weather monitoring and early warnings. It provides real-time weather information to the SCEDM and line Ministries. In close partnership with the Geographical Information Institute of the State Academy - a national research institute- it provides twice a day satellites images to the line Ministries and uses geographical information systems to monitor weather events and identify risk hotspots. The satellite images are used for ten daily and real-time weather data and forecasts and the issuing of early warnings/recommendations alerts through the SCEDM and respective line Ministries engaged in DRM. Forecasts are also provided on a quarterly and annual basis.

The national weather station network covers on average two stations per county (in total there are about 183 counties for agriculture in DPRK). Early warnings are generated by the SCEDM based on the information received by the National Bureau for Climate and Hydro-Meteorological Services together with the Geographical Information Institute. The dissemination of the early warnings follows two channels: sectoral and regional. The warnings and respective recommendations tailored and targeted for end-users of the respective sectors are distributed through the line Ministries, through their department for disaster management and focal points at provincial and county people's committees; in agriculture respectively, through the provincial rural management boards, county cooperative farm management boards and cooperative farms down to farmers. The main means of communication include a domestic computer network (currently operational at provincial level but only partly at country level). In addition telephones, mobile phones, TV, and mouth to mouth (e.g. through vehicles to remote villages that are not connected to telecommunication system) are key elements the early warning infrastructure.

National and sectoral risk assessments and monitoring are yet at it early stages. Current risk and vulnerability maps focus on risk spots in areas of high production. A national risk profile is currently under development, including main hazards per province and county. Each DDM of the line Ministries conducts basic risk assessment to inform seasonal and sectoral planning. A standardized methodology and risk/vulnerability as well as loss and damage assessments for sectors have not been developed yet.

Figure 1 National DRM organizational chart with focus on stakeholder involved agriculture and food security.



2.2. Disaster risk management in agriculture

The Ministry of Agriculture

The Ministry of Agriculture (MoA) has the overall mandate for agriculture production, animal husbandry and food security in the DPRK. Its various departments focus on seed management, crop production, livestock and veterinary services, irrigation, land management, and extension services. In 2013, the DDM was established. Its mandate is to coordinate and guide among the departments of MoA and across geographical scales DRM activities for the cropping, irrigation, construction and livestock sector. The department at national level consists of five experts covering expertise in construction, machinery, agricultural management, irrigation systems, and finance. At sub-national level the Provincial and Municipality/County Rural Management Offices have a designated officer or unit for disaster management.

The extension service is nation-wide established. The DDM is responsible to develop and disseminate protocols (technical guidelines) for good practices that include DRR/M measures. Extension support and material currently focuses stronger on techniques and technologies to increase production levels. The department, however, initiated the development of protocols for extension workers on techniques for disaster prevention and preparedness, particular in regards to mitigate the impact of floods. While the concept of prevention has been incorporated in the department's activities it has not reached out to farm cooperative level yet. In order to further strengthen the capacities and awareness for DRM at sub-national levels, the DDM plans to facilitate annual workshops among its technical experts related to DRM. The purpose is to exchange information, lessons learned and knowledge at national level and among provincial and county officers.

To further identify and validate good practices and technologies for DRM in agriculture the county *Unsan*¹⁸, located in the North Phyongan Province, was recently selected to start pilot-testing a combination of prevention and preparedness practices covering livestock, cropping, irrigation, land use and agriculture construction/infrastructure. The objective is to develop a model unit for other counties prone to natural hazards and related risk. A long-term strategy for awareness raising and transfer of knowledge about good practices for disaster prevention and preparedness is to support the development of model units in two counties per province.

¹⁸ Unsan has been heavily affected by floods in the recent years. In 2012-13 Unsan experienced 1450mm to 2000mm of rainfall instead of the normal precipitation of 900mm-1000mm. The recovery phase required almost 30 months.

In support of the DDM other technical department assigned Focal Point/Responsible Officers for Disaster Management as part of the terms of references and responsible for disaster-related issues in their technical areas. This includes the departments for livestock, extension services, irrigation, land use, and crop production.

The livestock department has constantly improved its disaster management capacities with regard to the prevention of animal pest and diseases. More resources and technical capacities are needed for enhanced access to prevention tools such as vaccination as well as preparedness measures like the strategic identification of evacuation areas for livestock.

Similar, the department of irrigation plays a crucial role to provide technical advice to the DDM of the MoA. The department of irrigation focuses on two main hazards: floods and drought. It is responsible for the management and use of water bodies, such as rain water collection, fresh water reservoirs, dikes, and drainage systems. In coordination with the MoLEP, the department is in charge to explore water sources, dig- out of groundwater for irrigation purposes, and the management of surface water resources and medium to small scale river schemes.

The department of construction of the MoA manages agriculture infrastructure. Similar to the department of livestock and irrigation, it provides technical support to the DDM. The department currently plans to expand its technical capacities in the field of slope protection to reduce the impact of intensive rainfall and damages to agricultural infrastructure.

In view of annual occurrence of floods, a special Committee for Flood Prevention is set-up before the incipient rainy season (July to August) to monitor and coordinate flood prevention and preparedness measures. The committee consists of the Minister and Vice Minister of the MoA and the Director of the DDM and other directors of relevant departments in MoA. The flood management system has advanced constantly over the past years including the formulation of flood preparedness plans. Such already on-going activities are planned to be integrated systematically in the national DRM system in coordination with the SCEDM and provincial committees for emergency response.

Although there is no national platform in place that addresses DRM issues, the MoA maintains an intranet homepage on agriculture production with access at provinces and counties where a computer network is available.

Academy of Agricultural Sciences

The Academy for Agricultural Science (AAS) was founded in 1948 as a specific research institution to support the MoA. Its mandate is to develop solutions for challenges faced in agricultural production, addressing food security from the perspective of sustainable agricultural development.

The AAS serves as a scientific advisory board to the MoA, and in close collaboration with the Ministry it provides technical support to the sub-national levels. The thematic areas cover extension services, livestock husbandry, poultry management, seed and water management, crop breeding, and cultivation management. The AAS portfolio on sciences and technologies for DRM has not been clearly defined yet. However, several research programmes already address scientific solutions for flood prevention, water logging, and soil salinity. Recently, higher priority is given to develop techniques to cope with drought spells, including crop breeding and drought tolerant varieties as well as water saving practices. It is intended to further expand its portfolio on research programmes and curricula on disaster risk with the focus on climate-related hazards.

As the line Ministries, the AAS works in partnership with the National Bureau for Climate and Hydrological Services. It receives every ten days real-time weather data and forecasts. Forecasts are also provided on a quarterly and annual basis. The AAS in collaboration with MoA and the National Bureau for Climate and Hydrological-Services develops protocols that provide technical recommendations to farms (distributed through the MoA extension services). The AAS has access to international climate data that is used for climate modelling and informs the research on crop generic resources. The AAS is also a partner in post-disaster loss and damage assessments.

2.3. Disaster risk management in key related line Ministries

Ministry of Land and Environmental Protection (MoLEP)

The Ministry of Land and Environmental Protection (MoLEP) coordinates the national management of natural resources including forest, watersheds, and land resources. It classifies nation's ecosystems according to their environmental and economic importance. Key activities with relevance for DRM covers flood protection, land protection, watershed management, and preservation of forests and control of illegal logging. The Ministry is also responsible for the implementation of recent updated

regulations on forest management, and the management of river basin and banks. While the overall governance and planning authority for land, water and forests resources is in the mandate of MoLEP, the use and management of land and water resources is distributed among other line Ministries; such as for land and small to medium river basins (below 2000 m²) at the MoA and the forest management for industrial purposes at the Ministry of Forestry (MoFR).

As the other line Ministries a DDM has been formed in 2013 which supervises, guides and coordinates activities with relevance for DRM among the technical departments in MoLEP, including land use planning, forest and integrated water management. Similar to the other line Ministries, MoLEP regularly analyses satellites images provided by the National Bureau for Climate and Hydro-meteorological Services to inform land use planning and monitoring of forests.

To monitor outbreaks of forest fires, mobile posts are operating and cameras have been installed on the summits of several high mountains on a pilot basis. Local fire brigades are in place at the provincial and county level; however they are not specialized in controlling and extinguishing forest fires. Current available risk assessments with relevance for the forest and environment sector remain too vague to trigger effective prevention measures. Furthermore the improvement of a telecommunication structure from national to county level is perceived as necessary to improve preparedness and response interventions related to landslides and fires.

In respect to the country's topographical characteristics, the protection of agriculture production relies significantly on joint efforts of MoLEP and the MoA. This refers foremost to reduce the impact of floods and soils erosion through reforestation on slopes and river banks or the sustainable management of water reservoirs and rivers. River basins are classified in different grades according to their significance for the agricultural production. In recognition of the need for sustainable water management and its relevance for flood prevention has led to the upgrading of all river basins allowing the higher allocation of national financial resources for their management. This year (2015), a nation-wide tree planting campaign started with the aim to re-vegetate mountains within 10 years' time. As part of this campaign, planting trees around watersheds such as river basins and reservoirs was given precedence in order to protect water resources and prevent floods. Further projects have been pursued to prevent floods by constructing dams at a certain interval along the courses of rivers so that sediments can be captured in the upper and middle reaches of rivers.

Ministry of Forestry

The Ministry of Forestry (MoFR) supervises the management of forests and production of timbers for industrial use (construction, furniture, pulp, etc.). The DDM of MoFR was inaugurated in June 2013 and is directly responsible for disaster management in forestry. It consists of four persons with two experts in forest industrial management, one expert in lumbering machinery, and one expert in forest ecosystem management. The DDM coordinates among and guides the departments/focal points of disaster management operating at the provincial forestry management boards under the umbrella of the MoFR.

The DDM has classified disaster risk in 3 grades according to the cost of the production facilities: high, medium and low. It is perceived as necessary to further fine-tune the classification system and develop technical tools to assess disaster risks in terms of their adverse impact on agriculture. As stated above a recent policy recognizes the value of forest ecosystems and targets to reduce the reliance of timber products. In order to shift from a response to a more proactive approach to disaster management, efforts have been made in initiating the establishment of a computer network that goes beyond the provincial levels and covers county offices and rafter stationeries to facilitate information sharing and risk monitoring. Under the same objective, protocols have been initiated and distributed at local level to provide guidance how to prevent and respond to disasters in forestry.

Ministry of Fisheries

The Ministry of Fisheries (MoFI) manages and exploits fishery resources for food and nutrition security and improving people's livelihood. Its main mandate covers the fishing industry, sea fisheries, inland aquaculture, cultivation of seaweed and the processing of fish products. Inland fisheries and aquaculture as well as rice-fish farming systems on cooperate farm level are guided in partnership with and coordinated by the livestock department under the MoA. The MoFI has established partnerships with neighbouring countries to control the spread of transboundary fish diseases. Unlike the other ministries with special disaster management departments, two officers in MoFI were assigned for disaster management in 2013. Their role is to promote prevention and preparedness measures as well as to provide early warnings through TV mass media to protect ponds, fishing facilities and construction assets in collaboration with the SCDEM. An evacuation system for fishing boats and equipment is operational. Current sectoral planning frameworks include assessments that focus on production, but only partly include risk and vulnerability factors. Similar, technical guidelines for fishing construction and infrastructure exists, but takes risk prevention measures only to limited extent into consideration.

2.4. Linkages between disaster risk management, climate change adaptation and natural resources management

The overall mandate for climate change - including adaptation and mitigation - and natural resources management is under the authority of MoLEP.

In 2006, a National Action Plan to combat Desertification/Land degradation has been developed under the main mandate of MoLEP. The plan recognizes the nexus between land degradation and natural disasters in two main land use categories; i) degradation of forest land and ii) degradation of agricultural land. The plan's Programme 9 on "*Technological transfer for mitigating natural disasters*" identifies from environment and land use perspective priority areas including risk assessment, hydro-meteorological forecast/early warning system, and the development of strategy and action plan for preparedness against disasters.¹⁹ Such efforts are indirectly linked and can highly contribute to the mitigation of risk to the agriculture sector.

In 2012 a Climate Change Report has been formulated. The development of a comprehensive strategy to combat climate change under the mandate of MoLEP focusing on land use and environmental issues has been planned for the near future.

Moreover, A National Strategic Action Plan for food crop genetic resources management to adapt to climate change was formulated which includes specific actions for germ plasm enhancement against biotic and abiotic stresses like submergence, drought, pests and diseases under climate change. The actions are expected to facilitate the development of food crop cultivars that will contribute to the sustainable crop production under climate change.

Since the relatively recent creation of institutions dealing with DRM no functional institutional mechanism linking disaster management and climate change has been established yet. The strong commitment of the Government to strengthen its capacities for DRM in all sectors offers a unique momentum to update, further elaborate and strategically align DRM, climate change adaptation (CCA) and sustainable natural resources management efforts to seek their synergies in the agriculture sector. The Sendai Framework for DRR (2015-2030) is recognized to serve as an overall guidance to link disaster prevention, mitigation, response and rehabilitation with CCA and sustainable development.

¹⁹ Source: National Action Plan to combat Desertification/Land degradation in Democratic People's Republic of Korea (2006-2010).

3. Strengths, needs and priorities for enhancing capacities in disaster risk management for food security

This chapter summarizes the assessment methodology and key findings on strengths, needs and potential priority actions to enhance capacities in DRM for food security.

Assessment methodology

The identification of strengths, needs and priority actions to enhance the institutional capacities²⁰ for DRM is based on (i) individual consultation meetings, (ii) two brainstorming sessions and training seminars, (iii) a questionnaire, and (iv) one validation work shop.

The individual consultation meetings with representatives from MoA, MoFR, MoLEP, MoFI, AAS, CBS and SCEDM provided a first generic overview of the relevant institutions for DRM in agriculture and related sectors as well as their role, responsibility and ongoing or initiated activities as outlined in chapter two of this report.

A joint brainstorming workshop held thereafter with the line Ministries altogether allowed to fine-tune the national profile of existing strengths and needs/gaps. The workshop's group discussion has also facilitated the identification of potential actions for enhancing the institutional capacities in DRM for food security.

As follow up two awareness-raising training seminars on DRM system analysis were designed and held with the same representatives. The first session focused on (i) key terminology of DRM, (ii) the sustainable livelihood framework and (iii) the importance to include communities in risk assessments and DRM planning for assessing effective entry points and interventions. This involved a presentation and exercise on Participatory Rural Appraisal tools. The second training session focused on key components of DRM, its linkages to CCA and 14 key institutional processes for DRM with examples from the agriculture sector. The third training session outlined key steps of conducting an institutional analysis for DRM, which was combined by a modified SWOT analysis²¹.

²⁰ While the focus of the assessment was to assess institutional capacities, technical capacities and assets were identified where considered to complement already existing institutional capacities.

²¹ Strengths, weakness, opportunities and threats (SWOT)

As part of this analysis a structured questionnaire was developed and distributed during the training to guide the assessment of existing strengths, needs/gaps and potential priority actions for DRM in agriculture, livestock, fisheries/aquaculture and natural resources (land, water and forests) management. The questionnaire also facilitated and structured the training group discussions along 14 key DRM processes and linked them to the priority areas of the Sendai Framework for DRR (2015-2030). The questionnaire was structured along four thematic clusters/areas on the basis of the four priority areas for action of the Sendai Framework for DRR: (1) Understanding disaster risk; (2) Risk governance; (3) Building resilience through prevention and mitigation measures; (4) Preparing for and building back better after disasters. Each thematic cluster was further divided into sub-sections relating to 14 key DRM processes. The thematic area of risk governance, for instance, included two sub-sections on “National policies, strategies and plans for DRM” and “Institutional structures and coordination mechanisms for DRM within and across sectors”. The sub-section encompasses specific measures along three categories (i) existing capacities, (ii) capacity needs and (iii) potential actions. For the latter two categories, the participants were asked to set priorities by ranking their selection.

A final validation workshop with selected key stakeholders of the concerned line Ministries/Committee served to review the assessment findings, to fine-tune actions and develop an institutional chart of stakeholder involved in the assessment process and their role in the national DRM system (see page 14). The results of the consultation process have been consolidated in this capacity needs assessment report.

Assessment findings

The overall evaluation²² of the questionnaire revealed that 85% of the participants identified actions related to risk governance - with a special focus on national planning frameworks - as the most urgent need and priority for action. This is followed by the thematic cluster of understanding disaster risk (66%) with priority given to risk assessments, awareness raising and information management. Special needs for hands-on training under the respective areas are perceived in the fields of DRM planning in agriculture sub-sectors (66%); tools for community-based DRM planning, and identification and application of good practices for prevention and mitigation (55%); risk assessment (55%); loss and damages assessment tools and

²² This evaluation was done on a basic quantitative analysis, including the absolute numbers of identified needs and actions and their percentage in relation to the total number of participants and thematic clusters. Thus these numbers provide an overall picture of needs and interests, but cannot reflect adequately the national priorities.

guideline for building back better (72%). Further priorities relate to improvement of communication structure, including equipment, in regards to awareness raising (72%) risk monitoring (38%) and early warning systems (44%).²³ The following tables consolidate the main findings of the capacity needs assessment for each of the institutions whose representatives participated in the consultation process and validated the results.²⁴

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²³ Percentages refer to each thematic cluster receptively.

²⁴ The structure of the tables refer to the Priorities for Action of the Sendai Framework for DRR with the minor deviations adjusted to the national context, such as ‘budget allocation’ under risk governance (instead of DRR for resilience) or ‘post disaster assessments’ under preparedness (instead of understanding the risk). Numbers under the column for potential actions represent the ranking according to their priority for the respective institution. Overall priority was given to priority areas 1 to 3.

Understanding Disaster Risk

“Policies and practices for disaster risk management should be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment. Such knowledge can be leveraged for the purpose of pre-disaster risk assessment, for prevention and mitigation and for the development and implementation of appropriate preparedness and effective response to disasters.”
(Sendai Framework for DRR, 2015; 23; p. 10))

Institution	Strengths	Needs/Gaps	Priority Actions
SCEDM	<ul style="list-style-type: none"> • Survey and assessment department established • National risk profile currently under development • Mechanism established to share weather and climate forecasting between the National Bureau for Climate and Hydro-meteorological Services and all Ministries/departments involved in disaster management 	<ul style="list-style-type: none"> • Processing and analysis of collected data on risks (from all concerned ministries) • National DRM terminology yet not clearly defined 	<ol style="list-style-type: none"> 1. Develop a standardized disaster risk assessment methodology that can serve as a model for all sectors 2. Develop a risk classification system that defines criteria for alerts. 3. Fine-tune/foster risk relevant data sharing/communication mechanism with line ministries (including communication structure/equipment) 4. Hold a national conference on raising awareness and agree on a common national terminology for DRM 5. Provide training in data collection at provincial and county committees
MoA	<ul style="list-style-type: none"> • Regularly (10 daily basis) interprets climate and hydro-meteorological data and provide recommendations to provincial and county • Strong partnership with AAS established on technical assistance and weather data interpretation. 	<ul style="list-style-type: none"> • Missing advanced communication structure (e.g. computer network) down to county level • Drought monitoring is in its early stages. Drought impact analysis needs also take into consideration prediction of climate change scenarios to inform long-term drought 	<ol style="list-style-type: none"> 1. Improve equipment of provincial and county offices to facilitate risk monitoring of flood and drought/drought spells 2. Conduct sample risk assessment in hazard prone counties to inform pilot-testing of good practices. 3. Conduct awareness raising trainings for

	<ul style="list-style-type: none"> • Agriculture homepage with technical information at domestic intranet available 	planning in agriculture	county and provincial offices on DRM and CCA to improve data collection for risk assessment and monitoring
MoLEP	<ul style="list-style-type: none"> • Regular updates land use planning and monitors forests • Cameras installed on the mountain summits on a pilot basis to better monitor the outbreaks of forest fires • Stationary and mobile posts for monitoring 	<ul style="list-style-type: none"> • Missing detailed information on risk drivers and impacts to further specify effective prevention measures in land and water management • Shortage of awareness among officials, experts and people about the value/nexus of natural resources (land, water forest) for disasters risk management • Improvement of a telecommunication structure from national to country level 	<ol style="list-style-type: none"> 1. Establishment of remote sensing system for monitoring forest fire (jointly with MoFR) and reservoirs (linked with MoA) 2. Development of tree pest and diseases monitoring, warning and control systems (jointly with MoFR) 3. Establishment of a model of watershed monitoring system based on international standards
MoFR	<ul style="list-style-type: none"> • Basic disaster classification system in place based on production losses and economic costs • Commuter network with drafting stationaries on a pilot- basis established 	<ul style="list-style-type: none"> • Communication network for rapid information sharing at local level • Prompt and reliable forest fire monitoring and alert system needed 	<ol style="list-style-type: none"> 1. Establishment of remote sensing system for forest fire monitoring (jointly with MoLEP) 2. Development of tree pest and diseases monitoring, warning and control systems (jointly with MoLEP) 3. Establish a detailed classification system of disaster risks affecting forests management (jointly with MoLEP) 4. Identify opportunities to improve reporting and feedback mechanism with stationaries 5. Provide equipment to improve domestic communication network to facilitate information sharing and early warnings to sub-national level and among forest related line ministries (MoLEP and MoA).

MoFI	<ul style="list-style-type: none"> • Interprets climate and weather data and provides general recommendations to cooperative fish farms 	<ul style="list-style-type: none"> • Know-how of technical officers and equipment in fish disease detection and monitoring. • Improved sector specific risk assessment for locating aquaculture/fish ponds • Remote sensing to improve the early warning system and long-term forecasting. 	<ol style="list-style-type: none"> 1. Training of technical officers at national and provincial level on concepts of risk analysis and process for aquaculture 2. Hands-on training to conduct climate impact and risk assessments that inform the identification location specific prevention measures (assess the underlying risk factor in fishing infrastructure structures) 3. Encourage learning exchange workshop/visits and training with other countries on lessons learned on disaster risk reduction in fisheries and aquaculture 4. Remote sensing system for improved EW and forecasting.
AAS	<ul style="list-style-type: none"> • Specialized research institutes and provincial academies of agricultural sciences are available to assess risks • On-going programmes for crop growth simulation, GIS and satellite image interpretation • Receives and interprets climate and weather forecasts and anticipates impacts on agricultural production and submit recommendation to MoA 	<ul style="list-style-type: none"> • Hazard specific risk assessment tools needs to be developed • Further improve crop growth simulation technique and satellite image analysis • Availability of rapid and accurate agricultural weather data • Improved weather forecasting capacity and analysis on potential impact scenarios for agriculture and livestock • Capacities for long-term climate predictions 	<ol style="list-style-type: none"> 1. Support the installation of remote-sensing and early warning network for agriculture 2. Trainings of researchers in advanced crop growth simulation technology and satellite image analysis.

Strengthening disaster risk governance to manage disaster risk

Disaster risk governance at the national, regional and global levels is of great importance for an effective and efficient management of disaster risk. Clear vision, plans, competence, guidance and coordination within and across sectors as well as participation of relevant stakeholders are needed. Strengthening disaster risk governance for prevention, mitigation, preparedness, response, recovery, and rehabilitation is therefore necessary and fosters collaboration and partnership across mechanisms and institutions for the implementation of instruments relevant to disaster risk reduction and sustainable development.
(Sendai Framework for DRR, 2015; 26; p. 12)

Institution	Strengths	Needs/Gaps	Priority Actions
<ul style="list-style-type: none"> Promulgation of DPRK Law on disaster prevention, rescue and rehabilitation issued decree No 76 of Permanent Committee of Supreme People's Assembly of DPRK on June 27 2014 (63 articles and 6 chapters) 			
SCEDM	<ul style="list-style-type: none"> SCEDM and departments for disaster management hold coordination meetings every 6 months Provincial committees and focal points for disaster management in place Mandate includes prevention and mitigation, response and recovery First stage action developed National budget allocated for national DRM (all sectors) 	<ul style="list-style-type: none"> No cross-sectoral or sector-specific planning frameworks for DRM yet established to guide disaster management departments Institutionalized horizontal coordination/communication mechanism at sub-national levels Need to focus stronger on prevention and preparedness than emergency response 	<ol style="list-style-type: none"> Formulation of a comprehensive National Disaster Management Strategy encompassing prevention, mitigation and preparedness, response and primary recovery, and rehabilitation) Coordination strategy/facilitation of linking sectoral planning for DRM (e.g. among agriculture production with land and water use planning, forest management and environmental protection)
MoA	<ul style="list-style-type: none"> Disaster management department established, including institutional structure across geographical scales and budget allocation Formulated flood prevention strategies 	<ul style="list-style-type: none"> A cropping and livestock specific planning framework that address the most severe hazards (flood and drought) More fine-tuned vertical and horizontal communication and coordination 	<ol style="list-style-type: none"> Develop a strategic action plan for agriculture that is based on a wider stakeholder consultation process among national stakeholders (with related sectors) and selected

	<ul style="list-style-type: none"> • Sectoral development plan includes sporadically natural hazards, in particular floods 	mechanisms need to be improved	<p>provincial and county offices</p> <ol style="list-style-type: none"> 2. Improve communication network for DRM with sub-national offices for informing national programming and planning of DRM in agriculture and feedback on progress.
MoFR	<ul style="list-style-type: none"> • Disaster management department established, including institutional structure at sub-national (provinces and counties) level and budget allocation • Sectoral development plan includes sporadically natural hazards, in particular forest fire and landslides • 10-year plan for reforestation in place (linked with mandate of MoLEP) • Forestry management board at provincial level, and forestry stations in forestry areas • Strategic plan for flood prevention in forestry. • Nation-wide coordination mechanisms for flood and forest fire prevention in operation. • Basic forest fire warning and suppression system in place (linked with mandated of MoLEP) 	<ul style="list-style-type: none"> • Low experience of technical officers in disaster management or land use planning • In sufficient coordination mechanism to reach out to forestry stations • Shortage of trained DRM staff 	<ol style="list-style-type: none"> 1. Improve communication mechanism with sub-national offices for effective DRM in forest management 2. Develop a strategic action plan for DRM in Forest Resources Management
MOLEP	<ul style="list-style-type: none"> • Disaster management department established including institutional structure at sub-national (provinces and counties) level, and budget allocated. • 10-year plan for reforestation in place 	<ul style="list-style-type: none"> • Strategic action plan linking climate change adaption, mitigation, and disaster risk reduction with natural resources management 	<ol style="list-style-type: none"> 1. Develop DRM strategic action plan and include - where possible - linkages with CCA 2. Development of guidelines and action plans for afforestation and

	<ul style="list-style-type: none"> • Nation-wide tree planting campaign initiated (cut 1 plant 10) • Climate change report developed in 2012 • Close partnership and coordination structure with MoA on river and land management issues • Nation-wide rivers and streams management system in place and rivers and streams management stations in operation at provincial levels • Sectoral development plan include sporadically natural hazards, in particular floods • Nation-wide coordination mechanisms for flood and forest fire prevention in operation. • Basic forest fire warning and suppression system in place (linked with MoFR) 		<p>forest protection</p> <ol style="list-style-type: none"> 3. Improve communication mechanism with sub-national offices for effective DRM in forest , rivers, streams, road, environment management (jointly/linked to related ministries MoFR and MoA)
MoFI	<ul style="list-style-type: none"> • Two technical officers responsible for disaster management (integrated disaster management in ToRs) • Collaboration with other countries for transboundary threats • Sectoral development plan include sporadically natural hazards, in particular floods and tidal waves • National budget allocated for DRM 	<ul style="list-style-type: none"> • Current planning framework only includes partly disaster risk planning but focus more on production 	<ol style="list-style-type: none"> 1. Train national and provincial officer in DRM planning and institutional analysis in fisheries 2. Introduce international guidelines for safety standards and management systems 3. Develop strategic long-term action plan (for fisheries or linked with agriculture plan) for resilience building (including food security and nutrition)

<p>AAS</p>	<ul style="list-style-type: none"> • Close collaboration established with MoA for science based policy advice and technical support • Experience in the formulation of strategic plan for the development of agricultural science and technology, including strategic action plan for food crop genetic resources management to adapt to climate change • Agricultural University in place under it and partnerships with provincial agricultural universities/colleges • Specialized research institutes and provincial academies of agri. sciences, experimental farms are in place • Several research activities relate to DRR as techniques to cope with drought spells, water logging, floods, salinity, and pest disease control. 	<ul style="list-style-type: none"> • Current lectures only include partially natural hazards or climate change • DRR and CCA are not fully explicitly included in the strategic plan for research programmes on science and technology. 	<ol style="list-style-type: none"> 1. Formulation of a research portfolio across all research institutes of the AAS for DRR and CCA - including a programme on hazard-specific risk assessment and on plant pest and diseases, and sustainable soil management 2. Improve research capacities to develop lectures on disaster risk reduction and climate change in agricultural science 3. Actively promote joint and collaborative research programmes among research institutes
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Vulnerability and risk reduction measures (Investing in disaster risk reduction for resilience)

“Public and private investment in disaster risk prevention and reduction through structural and non-structural measures are essential to enhance the economic, social, health and cultural resilience of persons, communities, countries and their assets, as well as the environment. These can be drivers of innovation, growth and job creation. Such measures are cost-effective and instrumental to save lives, prevent and reduce losses and ensure effective recovery and rehabilitation.” (Sendai Framework for DRR, 2015; 29; p. 15)

Institution	Strengths	Needs/Gaps	Priority Actions
SCEDM	<ul style="list-style-type: none"> • Awareness raising among DRM planners initiated 	<ul style="list-style-type: none"> • No national public awareness raising campaign yet in its beginning stage 	<ul style="list-style-type: none"> • Further elaborate public awareness raising campaign for promoting a culture of resilience, including to hold awareness raising events on main hazards, vulnerability and resilience building (with relevance for sectors and nationwide)
MoA	<ul style="list-style-type: none"> • Concept of prevention has been incorporated in the department for disaster management activities • Extension material on cropping, fishing and livestock techniques exists • Proactive flood protection measures with the irrigation department and other departments have been encouraged • County -level rivers streams management stations established 	<ul style="list-style-type: none"> • Technical skills for slope protection to reduce the impact of intensive rainfall and damages to agricultural infrastructure. • More experience needed in prevention and mitigation good practices for cropping and agriculture infrastructure/construction sector • More resources and technical capacities in the livestock department are needed to identify and access prevention and preparedness tools (vaccination and identification of evacuation areas for livestock) • Shortage of human and technical tools 	<ol style="list-style-type: none"> 1. Establish model units for good practices for prevention and mitigation of impacts from drought, flood and animal pest and disease in the cropping and livestock activities (4 pilot farms in 4 provinces plus an national-level pilot farm (Unsan county) for DRR in crop production, and 1 national -level pilot livestock farm for DRR in livestock farming as well as integrated/cyclic farming at national level in Bukchangy) 2. Improve human resources and equipment for county level river streams stations 3. Facilitate annual workshops among its technical experts related to disaster management to exchange information, lessons learned and knowledge at national level with the participation of provincial officers. This workshop should be replicated on provincial level with

		<p>available at county level for designing rivers and streams (jointly with MOLEP)</p> <ul style="list-style-type: none"> • On farm technical know-how on prevention and preparedness techniques • Missing knowledge about adequate drought specific/water saving practices and technologies • Shortage of equipment for repairing and maintaining dams and banks 	<p>involvement of county officers.</p> <ol style="list-style-type: none"> 4. Conduct awareness raising field days on farm level on DRR and CCA 5. Technical guidance and equipment in improvement/construction of dikes exposed to tidal waves (jointly with MoFI) 6. Identify more water-saving farming practices and equipment based on domestic lessons learned and international validated practices and available technologies 7. Training of trainers for local experts in designing rivers and streams in line with national goals and principals (jointly with MoLEP) 8. Develop /update extension material based on pilot-testing/model units
MoFR	<ul style="list-style-type: none"> • Tree seedlings nursery stations in operation 	<ul style="list-style-type: none"> • Knowledge about impact of timber industry on agriculture • Location-specific strategies for fire suppression • Technical capacities of experts and equipment for designing the constructions in rivers and streams integrated land and water use planning and conservation practices • Shortage of planting materials for reforestation (700 mill. seedlings/year) • Lack of tree species that are less inflammable 	<ol style="list-style-type: none"> 1. Establishment of model units for community-based fire management and up-scaling through workshops and seminars. Trainings should include the effective use of equipment and fire suppression and deploy locally available resources (jointly with MoLEP). 2. Reinforcing tree seedlings mass-production system Application of up-to-date good practices and techniques, including summertime tree-planting technology and Introduction of less-inflammable tree species 3. Training of experts at national and provincial level in designing forestry areas 4. Knowledge transfer of advanced forest fire suppression techniques from other countries

MoLEP	<ul style="list-style-type: none"> • Tree seedlings production stations in operation • Institutes for the design of rivers streams and forests 	<ul style="list-style-type: none"> • Technical capacities of experts and equipment for designing the constructions in rivers and streams integrated land and water use planning and conservation practices • Shortage of planting materials for reforestation (tree seedlings: 700 million seedlings per year). • Lack of tree species that are less inflammable • Location-specific strategies for fire suppression 	<ol style="list-style-type: none"> 1. Establishment of model units for community-based fire management and up-scaling through workshops and seminars. Trainings should include in the effective use of equipment and fire suppression and deploy locally available resources (jointly with MoFR). 2. Training of experts at national and provincial level in designing rivers and streams (linked with MoA) integrating DRM into protocols 3. Establish and implement guidelines for sustainable land-use management in upland areas (linked with MoFR and MoA) including technical tools for integrated forest and watershed management. 4. Transfer of advanced forest fire suppression techniques from other countries (linked with MoFR).
MoFI	<ul style="list-style-type: none"> • Close partnership established with MoA on rice fish farming and cycle production systems and integrated crop, livestock fishing farming 	<ul style="list-style-type: none"> • Lack of advanced technologies to construct infrastructures like fishing ponds, wharf side, dikes 	<ol style="list-style-type: none"> 1. Integrate risk reduction in technical guidelines for in fishery and aquaculture construction and train technical officer at sub-national level in their application. 2. Provision of equipment and apparatuses for the research and education on simulation trials for aquaculture and fish/seaweed farming 3. Knowledge transfer from other countries about risk-proofed aquaculture and fishing facilities, seaweed production, infrastructure management, etc.
AAS	<ul style="list-style-type: none"> • Provides training to MoA officers • Started research programme to enhance water-saving / drought 	<ul style="list-style-type: none"> • The current technologies for focus on response or short term preparedness • No or little germ plasm resources resistant or tolerant to natural hazards • Little experience and knowledge about 	<ol style="list-style-type: none"> 1. Develop training of trainers material in DRM - CCA (jointly for AAS and MoA staff) 2. Collection of germ plasm from international institutes and other countries 3. International trainings, information sharing, equipment

	<p>prevention techniques</p>	<p>the techniques of detecting and utilizing resistant/tolerant germ plasm</p> <ul style="list-style-type: none"> • Knowledge about good farming practices in DRM, particularly crop culture techniques more resilient to different hazards. • No training material related to climate change or natural hazards available • Seed coating material and the development of agro -chemicals to prevention plant pest and diseases (currently 10-17% of crops are lost) • Need to improve irrigation equipment and techniques for drought prevention 	<p>for the transfer and application of advanced technologies of relevant germ plasm selection and use</p> <ol style="list-style-type: none"> 4. Develop awareness raising material on cropping and livestock techniques to enhance resilience of livelihoods to climate change and disaster risk reduction 5. Develop training material on integrated pest management for agricultural technicians
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Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction.

The steady growth of disaster risk, including the increase of people and assets exposure, combined with the lessons learned from past disasters, indicates the need to further strengthen disaster preparedness for response, take action in anticipation of events, integrate disaster risk reduction in response preparedness and that ensure capacities are in place for effective response and recovery at all levels. Empowering women and persons with disabilities to publicly lead and promote gender equitable and universally accessible response, recovery rehabilitation and reconstruction approaches are key. Disasters have demonstrated that the recovery, rehabilitation and reconstruction phase, which needs to be prepared ahead of the disaster, is a critical opportunity to build back better, including through integrating disaster risk reduction into development measures, making nations and communities resilient to disasters.

(Sendai Framework for DRR, 2015; 32; p. 18)

Institution	Strengths	Needs/Gaps	Priority Actions
SCEDM	<ul style="list-style-type: none"> • Issues early warnings to line Ministries and committees on provincial and county level • Nation-wide early warning and response mobilization system in place • Coordinates among departments involved in damage and loss assessments • Coordinates among all departments and institutions responsible for disaster management actively involved in recovery planning and interventions 	<ul style="list-style-type: none"> • Standardized methodology for damages and loss assessment needs • DPRK-specific assessment and designing tools for building back better • Lack of awareness about disaster management at provincial and county level • Shortage of material reserves for disaster response and information schemes during rescue phase available at local level 	<ol style="list-style-type: none"> 1. Develop DPRK specific preparedness and response assessment tool including a methodology for damages and loss assessment 2. DPRK specific MIRA and training of 1072 county officer in rapid assessment

MoA	<ul style="list-style-type: none"> Committee for Flood Prevention set-up before the incipient rainy season to monitor and coordinate flood prevention and preparedness measures. 	<ul style="list-style-type: none"> Standardized post-disaster impact assessments methodology for cropping and livestock sector Shortage of technical equipment and tools for emergency response (e.g. communication, vehicles, agricultural tools) 	<ol style="list-style-type: none"> Increase technical support from national level to local level for disaster preparedness Regularly conduct preparedness exercises for agricultural extension officers Updating the existing emergency preparedness guidelines and designing protocols
MoFR	<ul style="list-style-type: none"> Protocol (technical guidelines) how to respond to disasters in timber production developed and distributed 	<ul style="list-style-type: none"> Lack of reliable and prompt forest fire warning system. Lack of human resources of forest fire brigades 	<ol style="list-style-type: none"> Improve communication infrastructure and procedures to provide, fire fighters and managers with information on the location, size and burning conditions.
MOLEP	<ul style="list-style-type: none"> Support from local fire brigades A mobilization system for fire suppression and reforestation 	<ul style="list-style-type: none"> Lack of post-fire impact assessment tools 	<ol style="list-style-type: none"> Promote the development and use of timber alternatives to lower the industrial dependence on timber Disseminate fire early warnings through mass media Improvement of fire suppression tools Introduction of elite tree species Transfer of pest and disease management techniques Development of pre- and post-forest fire impact assessment tool and training county offices in their application
AAS	<ul style="list-style-type: none"> Participates in post disaster needs assessment Participation in the consultations with stakeholders for post-harvest rehabilitation of farms 		

<p>MoFI</p>	<ul style="list-style-type: none"> • Basic post –harvest loss and damage assessment tool available • Response structure established 	<ul style="list-style-type: none"> • Need for advanced early warning and rescue mechanisms • Lack of equipment to repair/rehabilitated infrastructure(fish ponds, seaweed facilities, wharf sides, dikes, etc) damaged by high tides 	<ol style="list-style-type: none"> 1. Improve preparedness capacities of affected fishing communities through training on safety at sea 2. Improve methodology for post disaster needs assessment in fisheries 3. Increase technical and material assistance for reinforcing/rehabilitation infrastructures and facilities
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4. The way forward

The assessment findings confirm that the DPRK has recognized DRM as a key component for its national food security and the relevance of sustainable natural resource management to address the vulnerabilities and the underlying risk factors in the agriculture sector. This is reflected in the recent national campaigns, institutional arrangements and the sectoral engagement in DRM. The assessment findings have revealed that sectoral line Ministries have started to initiate several activities for DRM, among those foremost the established of an institutional structure that provides the required foundation for effective and sustainable mainstreaming of DRM within and across sectors.

Since the DRM system in the DPRK is still relatively young, its institutions need to gain more experience in implementing DRM measures on the ground, guided by a strategic long-term plan. In this regard, the respective DDMs and the SCDEM have expressed the need for further technical assistance to strengthen institutional and technical capacities in DRR for food security. The MoA has started to draft a concept note for potential priority activities that build on the initiative of this project, including both the national and the local level. The overall direction for potential follow-up activities have been briefly discussed during the assessment mission and include: (1) the establishment of a computer network for enhancing data processing, sharing, risk monitoring and alerts at sub-national level; (2) the development of a Strategic Action Plan for DRR in Agriculture²⁵; and (3) the establishment of model units (demonstration sites) for DRR good practices in agriculture in four provinces.

This capacity needs assessment is a first step for triggering strategic actions that are line with the national priorities. Further assistance is needed to support the efforts of the MoA and its partners in mobilizing resources and in providing technical guidance and advocacy for strengthening national capacities to proactively address disaster risk in agriculture.

²⁵ Including sectoral measures and the required mechanism for coordination and progress monitoring. While the detailed planning process and scope will be defined by the Government of the DPRK, MoA indicatively expressed the need to inform the planning process by risk assessment samples in main agro-ecological zones and through a bottom-up and participatory consultation process.

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