Kingdom of Cambodia

Nation Religion King

General Directorate of Agriculture

Ministry of Agriculture, Forestry,
and Fisheries

Plan of Action for Disaster Risk Reduction in Agriculture 2014-2018

DECEMBER 2013

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Humanitarian Aid
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FOREWORD

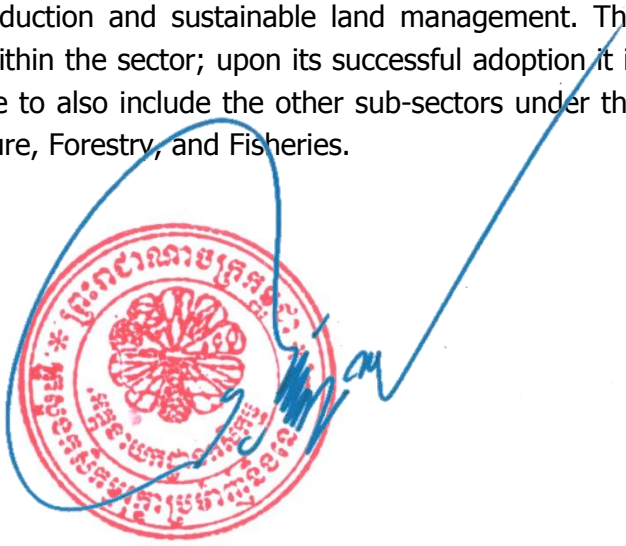
Cambodia is increasingly affected by disasters such as floods, droughts, pest and diseases, and storms. Just within the last decade, the country has experienced more than twice severe floods, one damaging typhoon (Ketsana), and several local droughts and pest infestations. These phenomena cause damages and losses of lives, properties, infrastructure, and livelihoods which impede and set back development efforts, divert development funds, and put fragile agricultural eco-systems at risk. Impacts of disasters and climate change related risks on agriculture often lead to a situation of food and/or nutrition insecurity that affect most the poor and vulnerable people including women, children, and people living with disabilities with its ultimate repercussion on the nation's economic growth. Impacts are a question of primary concern, as they directly impinge upon objectives of sustainable development. The Royal Government of Cambodia in general and the General Directorate of Agriculture (GDA) of the Ministry of Agriculture, Forestry, and Fisheries in particular is dedicating the strong efforts to counterbalance the impacts.

The commitment prompted the GDA to develop this Plan of Action for Disaster Risk Reduction (DRR) in Agriculture, 2014-2018, in order to systematically address and guide the implementation of targeted actions to mitigate agricultural damages and losses and lessen the suffering of the farmers and agriculture dependent communities from the impacts of natural hazard. The plan will contribute to the realization of the National Strategic Development Plan 2014-2018 and the political program of the Royal Government of Cambodia, especially the Rectangular Strategy Phase 3.

The Department of Agriculture Land Resources Management provided overall leadership and coordination to the consultative stakeholder process initiated for the development of the plan; active participation included all departments and institutions within the GDA, Provincial Departments of Agriculture (PDAs), Provincial Departments of Water Resources and Meteorology (PDoWRAM), Provincial Committees for Disaster Management (PCDMs), and other stakeholders and DRR actors in Cambodia. The Food and Agriculture Organization of the United Nations (FAO) provided technical assistance with financial support from the European Commission's Humanitarian Aid and Civil Protection (DIPECHO).

This Plan of Action for DRR in Agriculture 2014-2018 was designed as a practical living and guidance document, a work agenda, and a roadmap to include key aspects of disaster risk reduction (DRR) into the sustainable development agenda of

agriculture, especially for crop production and sustainable land management. The plan with focus on GDA is a pilot within the sector; upon its successful adoption it is planned to further expand its scope to also include the other sub-sectors under the responsibility of Ministry of Agriculture, Forestry, and Fisheries.



SO Khan Rithykun
Delegate of the Royal Government
In charge of Director General of the General Directorate of Agriculture
Ministry of Agriculture, Forestry, and Fisheries

ACKNOWLEDGEMENT

The Plan of Action to strengthen capacities for disaster risk reduction and climate change adaptation in agriculture sector was prepared on the basis of a wide participatory consultation process with key stakeholders from agriculture, disaster risk reduction, and development. The formulation process was coordinated by the Department of Agriculture Land Resources Management (DALRM) of General Directorate of Agriculture (GDA) of the Ministry of Agriculture, Forestry, and Fisheries; with the active participation of the technical departments of GDA, provincial departments of agriculture, the provincial departments of water resources and meteorology, and the provincial committees for disaster management. The Food and Agriculture Organization of the United Nations (FAO) in Cambodia facilitated the plan's development process under the project "Enhancing capacities for disaster risk reduction in agriculture in Cambodia and the Philippines" with financial support from the European Commission's Humanitarian Aid and Civil Protection (DIPECHO).

My special thanks are to H.E SO Khan Rithykun, the delegate of the Royal Government in charge of Director General of the General Directorate of Agriculture for his overall supervision, strategic guidance and encouragement to the process. Without his support, this plan would not have been developed. Also acknowledged are Mr. Srun Sokhom and Miss. Chann Phaloeurn, Deputy General Directors of GDA for their leading roles in the development of the Plan of Action. Appreciation goes to all departments and their representatives for their technical contributions and inputs to the planning.

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EXECUTIVE SUMMARY

Agriculture is one of the most disaster affected sectors. Agricultural production and livelihoods, particularly of the majority of smallholder farmers in Cambodia are recurrently affected by a variety of natural hazards. Smallholder farmers in Cambodia are particularly vulnerable to natural hazard impacts since (i) their hazard exposure is high (ii) the common pattern that there is only one rice crop per year, most often planted under rain fed conditions, and (iii) the fact that the per hectare agricultural production, particularly of rice, is significantly lower than in other South East Asian countries. The high hazard exposure coupled with low production levels threatens livelihood security of thousands of smallholder farmers in the country, particularly during and after the emergency period.

To better prepare for these impacts, the General Directorate of Agriculture (GDA) of the Ministry of Agriculture, Forestry, and Fisheries (MAFF) with financial support from the Food and Agriculture Organization of the United Nations (FAO) in Cambodia and the European Commission's Humanitarian Aid and Civil Protection (DIPECHO) facilitated to develop a five-year Plan of Action (POA) for Disaster Risk Reduction in Agriculture. This Plan of Action is designed as practical guidance document, a work agenda, and a roadmap to include key aspects of disaster risk reduction (DRR) into the sustainable development agenda of agriculture, especially for crop production and sustainable land management within scopes and mandate of GDA. It also seeks the synergy of resources and efforts to holistically address disaster risk reduction, climate change adaptation, and sustainable land management issues in the sector.

The plan composes of 4 Chapters. The first chapter is an introduction, which describes the geographical situation of the country, the needs for the sectoral plan of action, its scope, guiding principles, and planning process. The second chapter elaborates key hazards that potentially affect the agriculture sector and the policy frameworks and guidelines on DRR that shape this Plan of Action. The third chapter discusses the plan of action framework including the goal, anticipated outcomes, and priority actions. The last chapter provides guidelines on the institutional mechanisms for the implementation of the plan and the key actors involved in DRR, climate change adaptation (CCA), and decentralized planning. There are several annexes which include the planning matrix for 2014-2018, a list of prioritized actions for 2014-2018, the summary of the Plan of Action, and the Hyogo Framework of Action (HFA).

The Priorities for Action outlined in the plan include 5 inter-linked areas which correspond with the structure of the HFA: (i) strengthening institutional and technical capacity for disaster risk reduction, climate change adaptation, and sustainable land management in agriculture; (ii) enhancing early warning systems; (iii) improving knowledge management, awareness raising and education on disaster risk reduction and climate change adaptation; (iv) reducing underlying vulnerabilities by improving technical options in agriculture; and (v) strengthening preparedness capacities for effective emergency response and rehabilitation and integration of disaster risk reduction and climate change adaptation interventions.

ACRONYMS

AADMER	ASEAN Agreement on Disaster Management and Emergency Response
Agromet	Agro-meteorology
CARDI	Cambodian Agricultural Research and Development Institute
CBDRR	Community based disaster risk reduction
CCA	Climate Change Adaptation
CCDM	Commune Committee for Disaster Management
CEDAC	Cambodian Center for Study and Development
DAE	Department of Agricultural Extension
DAEng	Department of Agricultural Engineering
DALRM	Department of Agricultural Land Resources Management
DAPAIC	Department of Administration, Planning, Accounting, and International Cooperation
DIC	Department of Industrial Crops
DCDM	District Committee for Disaster Management
DHSC	Department of Horticulture and Subsidiary Crop
DIPECHO	European Commission's Humanitarian Aid and Civil Protection
DOM	Department of Meteorology of MoWRAM
DRC	Department of Rice Crop
DRR	Disaster Risk Reduction
EWS	Early Warning System
FFS	Farmer Field School
GDA	General Directorate of Agriculture
HFA	Hyogo Framework for Action
INGO	International Non-Governmental Organization
MAFF	Ministry of Agriculture, Forestry, and Fisheries
MoWRAM	Ministry of Water Resources and Meteorology
NAL	National Agricultural Laboratory
NAPA	National Adaptation Program of Action
NCDM	National Committee for Disaster Management
NGO	Non-Governmental Organization
NSDP	National Strategic Development Plan
PCDM	Provincial Committee for Disaster Management
PDA	Provincial Department of Agriculture
PDoWRAM	Provincial Department of Water Resources and Meteorology
POA	Plan of Action
PPSPSD	Plant Protection, Sanitary, and Phytosanitary Department
SLM	Sustainable Land Management
SNAP	Strategic National Action Plan for Disaster Risk Reduction
UNDP	United Nations Development Programme
VDMG	Village Disaster Management Group

CONTENT

CHAPTER 1

INTRODUCTION

1. Background of Cambodia

Cambodia has an area of 181,035 square kilometers. It borders Thailand to the north and west, Laos to the northeast, and Vietnam to the east and southeast. It has a 443-kilometer coastline along the Gulf of Thailand. In 2010, the country had an estimated population of 14,805,358 people. Phnom Penh is the capital city of the Kingdom. Administratively, Cambodia is divided into 24 provinces including the capital, which are the first level of administrative division. Municipalities and districts are the second-level administrative layer in Cambodia. The provinces are subdivided into 159 districts and 26 municipalities. The districts and municipalities in turn are further divided into communes and quarters.

Cambodia's landscape is characterized by a low-lying central plain, surrounded by uplands and low mountains. Cambodia's landscape is divided into 3 major areas: costal zones, mountainous zone, and central low-land zone. The last zone, which represents the largest part (about 1/3 of the country) is the biggest economic area and has the highest population.

The Mekong River flows across Cambodia for about 550 Km connecting Laos to Southern Vietnam. The Mekong River is the main fresh water source for the majority of Cambodian people, used for both agriculture production and daily consumption. In addition, the Tonle Sap Lake (the Great Lake) is located at center of the country, which is the biggest fresh water lake in South East Asia and main source of fresh water fish for the country.

Cambodia's climate is dominated by monsoons, which are known as tropical wet and dry, because of the distinctly marked seasonal differences, the wet season starts from May to October and the dry season from November to April. The country experiences the heaviest precipitation from September to October and the driest period is usually from January to February. The annual average temperatures in Cambodia range from 21 to 35 °C. However, during the rainy season, which runs from May to October, temperatures can drop to 22 °C, and is usually accompanied with high humidity. At the end of the dry season around April, temperatures can rise up to 40 °C (Nobleman, 2003).

2. The Needs for Plan of Action for DRR in Agriculture

Over the last two decades, Cambodia has observed a significant trend of increased exposure to disasters, in particular to floods, droughts, pest and diseases, and storms but also to other hazards. The number of natural disasters augments with increased intensity. Just within the last decade, the country experienced more than twice severe floods, one devastating typhoon (Ketsana), and several local droughts and pest infestations. These phenomena cause damages to and losses of lives, properties, infrastructure, and livelihoods; they impede and set back development

efforts and divert development funds. Millions of dollars are spent to save lives and rehabilitate and recover people's livelihoods.

Agriculture is one of the most affected sectors. Agricultural production and livelihoods, particularly of the majority of smallholder farmers in Cambodia are recurrently affected by a variety of natural hazards. Smallholder farmers in Cambodia are particularly vulnerable to natural hazard impacts since their hazard exposure is high, the common pattern that there is only one rice crop per year, most often planted under rain fed conditions, and the fact that the per/ha agricultural production, particularly of rice, is significantly low. The high hazard exposure coupled with low production levels threatens livelihood security of thousands of smallholder farmers in the country, particularly during and after the emergency period.

Until recently Cambodia has applied a reactive disaster management approach, which meant to provide help and support to people after they had been affected by disasters. However, though the Strategic National Action Plan (SNAP) for diaster risk reduction (DRR), adopted by the government in 2008 in view of steadily increasing hazard risks and expanding losses, the government has paved the way for the paradigm shift in policies and thinking towards a proactive approach to DRR. This new approach gives equal importance to preventive actions, while recognizing the continued importance of well prepared and coordinated emergency support. It has remained a challenge though to mainstream this new, overarching approach of DRR into the sectoral development planning to proactively reduce damages and losses in all sectors, avoid suffering, and secure and improve agriculture production and farmers' livelihoods.

For agriculture, the paradigm shift has induced the need to (i) identify and promote thereafter concrete measures and processes, that will help to reduce risk exposure of farmers and communities, building on the existing know-how and comparative advantages for enhanced DRR that already exists within agricultural line agencies and among agricultural service providers; and (ii) to translate those needs into a strategic and comprehensive plan for DRR in agriculture, including measures for enhanced adaptation to the impacts of climate change. Concrete measures and options for enhanced prevention, mitigation, and better preparedness for response and recovery within the agricultural sector must be well articulated in this formal planning document. The plan will be instrumental to strengthen and systematize sectoral contributions to DRR, including in the context of climate change. Sustainable mechanisms to ensure that the plan will be systematically implemented must also be built into the plan. Once implemented the plan will help guide and structure a process of planned resilience building in the agricultural sector, with the ultimate objective of serving farmers and agriculture dependent communities and enhancing their resilience.

3. Scope of the Plan of Action

This Plan of Action for DRR in agriculture builds on the vision of the SNAP 2008-2013 for DRR of the Government of Cambodia and the Hyogo Framework for Action (HFA) for DRR. It contributes a sector specific perspective and activities to the overarching national policies and plans for disaster risk reduction and management coordinated by National Committee for Disaster Management (NDCM). More specifically, the plan,

will facilitate the systematic, strategic coordination and delivery of interventions for disaster risk reduction in the cropping sub-sector by GDA, in line with the national commitment to implement the HFA for DRR; it will complement and build on the existing mandates and responsibilities of GDA in the context of disaster response management and recovery; it will not replace these already existing mandates for emergency response, but ensure better linkages to them, particularly in view of enhanced planning of preparedness for response, and synergies between interventions related to disaster risk reduction and climate change adaptation. The rationale is that in the short term, climate change impacts are likely to be mainly felt through more frequent and intense hydro-meteorological hazards and that most measures applied in the current contexts of DRR and CCA are identical. However, the plan does not aim to explore all interventions that would be needed to holistically address climate change adaptation in the sector, but outlines main action areas for a five year period (2014-2018). Given GDA's financial and technical resource limitations, the need to prioritize interventions is reflected in the document; indicators, key deliverables and time lines for implementation are provided as well as establishing higher commitment for enhanced DRR among stakeholders in agriculture.

It is envisaged that the activities outlined in the plan will be included during next planning cycles into GDA's overall agricultural development planning. This sub-sectoral plan for GDA is considered as a pilot within the agricultural sector; it is planned to further expand its scope to the other subsectors under the responsibility of the Ministry of Agriculture, Forestry, and Fisheries (MAFF).

4. Guiding Principles

The development of this plan of action was built on the following key principles, which correspond to the guiding principles of National DRR/M Policies, the National Climate Change Policies and National Agricultural Policies, including to:

- Integrate DRR linked to CCA into sustainable agricultural development planning
- Ensure consistency, continuity and close coordination between preventive measures for DRR and emergency response planning and recovery
- Use a results-based planning approach
- Ensure full participation of key stakeholders including governmental, nongovernmental and community-based organizations and the private sector in design and delivery of the plan
- Recognize DRR as an investment in sustainable agricultural development
- Ensure linkages between economic and environmental resilience, DRR and CCA
- Use existing knowledge and capacities as the foundation to build on
- Define agricultural communities as the ultimate beneficiaries of GDA involvement and contribution to DRR

5. Process of Plan Development

The Plan of Action for DRR in Agriculture has been formulated following a three-step process.

- Stock-taking: a desk study and in-depth review of existing materials, such as plans, policies, and guidelines related to DRR and disaster management in the agriculture sector was conducted. DRR plans from other agrarian countries were also reviewed. The stock-taking exercise led to the formulation of a skeleton structure of the plan which was subsequently adopted and filled with contents specific to the Cambodian context.
- Stakeholder consultative meetings: formal and informal meetings were organized with DRR actors and agriculture-based NGOs to get in-depth views and inputs. National agricultural technicians and experts, the representative from PDAs, PDoWRAM, and PCDMs contributed their know-how during consultative meetings at national and regional levels. The consolidated inputs received constituted a first draft of the document.
- Technical review process and validation meetings: the draft plan was technically reviewed by experts within GDA and FAO. A formal technical in-house validation meeting was organized in GDA to fine tune the draft plan. An additional national workshop was conducted to capitalize on inputs from a wider audience of key stakeholders. The second draft of the plan was developed and again technically proof-read, reviewed, and cleared by FAO and GDA technical experts.

CHAPTER 2

DISASTER HAZARDS AND POLICY FRAMEWORKS FOR DRR IN AGRICULTURE

1. Disaster Hazards and Vulnerabilities in Agriculture

Agriculture in Cambodia is exposed to a range of hazards and threats. The threats addressed by this plan of action are those most affecting agriculture, namely floods, droughts, strong winds/storms as well as pests and diseases. In 2003, the NCDM and the UN World Food Program (WFP) mapped the most disaster-prone areas of the country; approximately 500 communes were identified as being prone to natural disasters: 260 prone to floods and 293 prone to drought. This is about one third of the total number of communes in the country (SNAP 2008-2013).

1.1 Floods

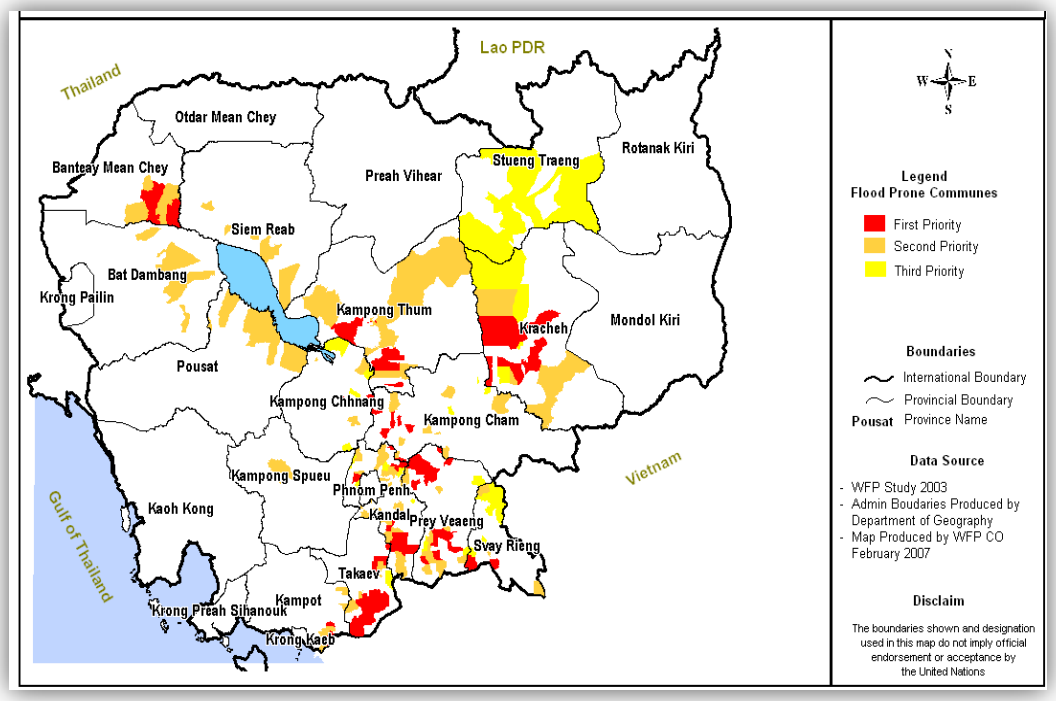
There are two major flood types in Cambodia:

- **Mekong flood (seasonal flood)** – Cumulative rainfall in the upper catchments throughout the rainy season causes a slow but steady rise in water levels lasting several days. This can be aggravated by two factors. Firstly, when this combines with heavy rains around the Tonle Sap Lake, which affect the provinces around the lake and the southern provinces. Secondly, the most severe floods occur when heavy rains coincide with the arrival of tropical depressions and storms. Mekong river floods are common occurrences in the provinces of Steung Treng, Kratie, Kampong Cham, Prey Veng, Svay Rieng, Kandal, and Takeo.
- **Flash floods** – Repeated heavy rainfall in mountainous areas, which flows into the streams and tributaries of the Mekong River branch of river often cause flash floods. These floods are swift and last only a few days, but often cause severe damage to crops and infrastructure especially in tributaries around the Tonle Sap basin. Flash floods have been reported to affect the provinces of Kandal, Kampong Speu, Kampot, Pursat, Battambang, Kampong Chhnang, Rattanakiri, Preah Vihea, and Otdor Meanchey.

Historical records indicate that since 1999, the intensity and frequency of floods have increased considerably (CEDAC, 2005). In Cambodia, there were major floods in 2000, 2001, 2009, 2011, and 2013. For the flood of 2011, the National Committee for Disaster Management (NCDM) estimated the cost of destruction at $521 million (MRC, 2011) with affected 431,476 hectares of rice fields, including 267,184 hectares being severely damaged by the main wet season. The total affected area represents about 17 percent of the total cultivated area to wet season paddy in 18 of the 24 provinces. Particularly affected were the provinces of Kandal, Kampong Thom, Prey Veng, and Kampong Cham (FAO/WFP, 2012). In 2013, the flood killed 168 people and affected more than 1.8 Million people in 20 provinces and 31,314 families were

evacuated to safe areas. 344,384 hectares of agricultural lands were inundated and 62,878 hectares of transplanted rice were damaged (NCDM, 2013).

Figure 1: Map of Flood-prone Communes



Source: SNAP 2008-2013

1.2 Droughts

A drought is considered a period of abnormal dry weather that causes serious hydrological imbalance in the area.

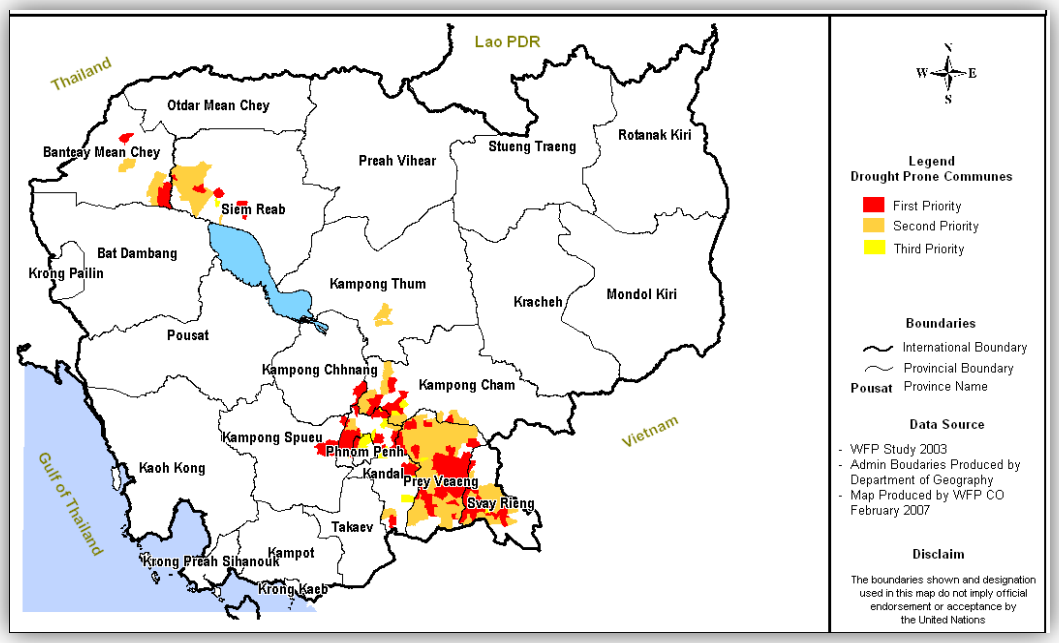
There are four characteristics of agricultural drought in the country:

- Unpredictable delays in rainfall onset in the early wet season
- Erratic variations in wet season rainfall onset, amount, and duration across different areas
- Early ending of rains during the wet season
- Common occurrence of mini-droughts of three weeks or more during the wet season, which can damage or destroy crops without irrigation

Localized drought is also becoming increasingly apparent and significant - again throughout many areas of the country, including areas that are also flood-affected. Drought affected a number of areas in 2001, 2002 and 2003. The direct impact has predominantly been in terms of water stress on agricultural crop production, especially rice and vegetable production, with 80% of agricultural fields lying idle in most areas for six months and to a somewhat lesser extent in terms of increased rates of water-related disease mortality and morbidity.

The last major drought in the country took place in 2002 when unusual dry weather during the rainy season affected some 420 communes in 76 districts located in the 10 provinces of Prey Veng, Kandal, Kampong Speu, Takeo, Svay Rieng, Kampong Thom, Kampong Cham, Kratie, Otdar Meancheay, and Banteay Meanchey. The drought prevailed until the onset of rains in mid-August and covered 62,702 hectares. Statistics from the NCDM indicate that the drought had affected 2,047,340 people or 442,419 families and was the worst drought to affect the country. The cost of the drought was estimated to be more than US$21.50 million (SNAP, 2008-2013).

Figure 2: Map of Drought-prone Communes



Source: SNAP 2008-2013

1.3 Plant Pests and Diseases

Pests, especially brown plant hoppers and other agents such as caterpillars, grasshoppers, and rats have posed problems for the agriculture prosperity. Pests in 2009 have destroyed about 4.500 hectares of rice crops in only four provinces near the Cambodian-Vietnamese border (Phnom Penh Post, 2009) The brown plant hopper (BPH) is one of the major pests of rice; not only in Cambodia. During the cropping seasons of 2006-2007, BPH outbreaks were reported. The provinces along the Vietnamese borders namely Kampot, Takeo, Kandal, Prey Veng, and Svay Rieng were the most prone areas to this agent. Thousands of hectares of rice in those provinces reported heavy infestation of BPH; and plants were observed to have been infected with the grassy and ragged stunt virus diseases (FAO/ICP, 2007).

Besides brown plant hoppers, Golden Apple Snails prevail its ravage for rice production especially rice seedling between 4-30 days. They have been imported to Cambodia between 1992, but until 2010, a significant and considerable destruction caused by Golden Apple Snails has been observed (CARDI, 2013).

Based on the 2004 estimation of the Cambodian Center for Study and Development in Agriculture (CEDAC), farmers spent in 2003 about $20 million on pesticides (the Cambodia Daily 2005).

1.4 Storm/Strong Wind

Extreme weather events, such as storms or typhoons are usually not considered a major problem in Cambodia, because the country is protected by surrounding mountain ranges. However, storms do occasionally affect the country with most of the storm-related damage caused by localized floods associated with heavy rain. Greatest damage occurs when these storms arrive during September and October when the seasonal discharge of the Mekong River is already high and a second significant peak to the annual flood is generated (SNAP, 2008-2013).

The last biggest storm in Cambodia's history was Ketsana Typhoon, which hit Cambodia between September 29 and October 5, 2009. Fourteen out of 24 provinces were affected by the storm and subsequent flash floods. The typhoon left 43 people dead, 67 people severely injured, and destroyed homes and livelihoods of some 49,000 families, or about 180,000 people, the equivalent of 1,4 percent of Cambodia's total population. The Post Damage Needs Assessment estimated the total damages and losses caused by this typhoon was about USD 132 million (damage: USD 58 million and loss: USD 74 million) in which the losses and damages contributed from agriculture sector were USD 56 million (NCDM, 2010).

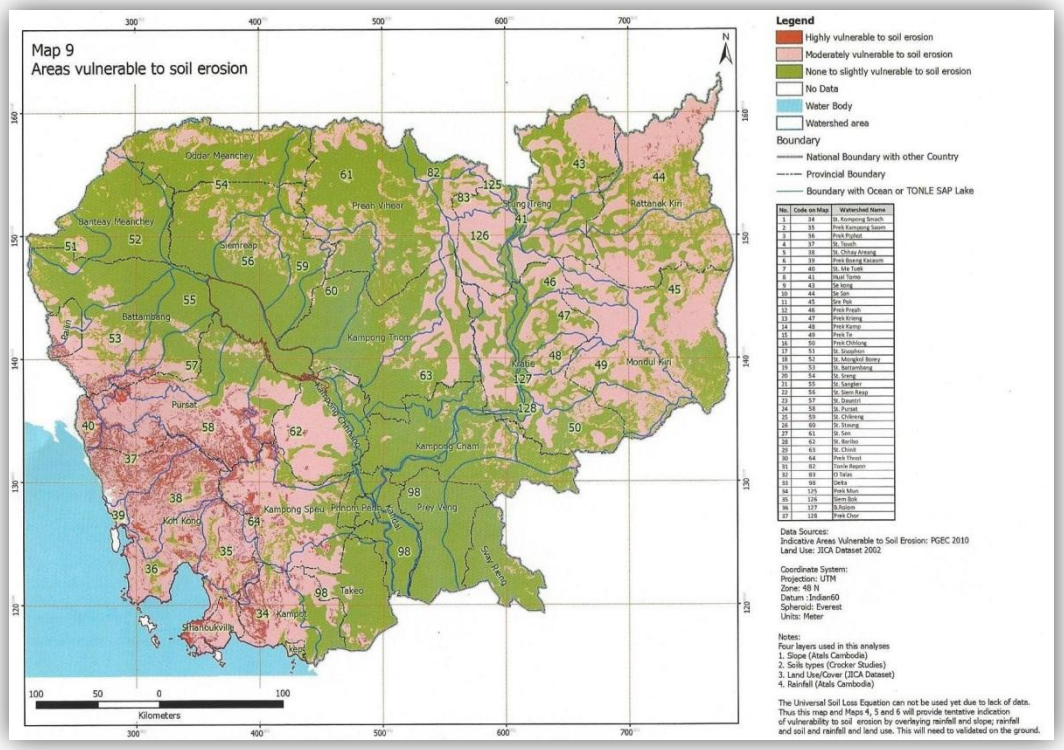
1.5 Underlying Vulnerabilities

Land degradation is considered as the most severe environmental issue enhancing the vulnerability of agriculture in Cambodia; if not brought to a hold, it may threaten the country's food security and food supply in the mid to long term. There are two main factors leading to land degradation which includes natural and man-made activities. The natural land degradation is the result of floods, drought, soil moisture and nutrient depletion. The causes of human-induced land degradation activities include the mono-cropping practices, unsustainable farming practices such as extensive tillage, sole reliance on chemical fertilizer and abandoned returning of organic residues into soil, the drastic depletion of forest cover, and mining (which increases intensity of soil erosion). Currently, land degradation is threatening the overall agriculture production including the agro-industry of Cambodia (MAFF, 2012).

Other underlying factors of risk and vulnerability include socio-economic conditions and development works which disregard DRR and CCA concepts, poverty pressure and unplanned human settlement.

The country remains one of the least developed countries in the world reflecting the impact of 30 years of war and social and political instability with a Human Development Index rank of 138 (0.54) in 2013 (UNDP, 2013). Poverty is a key determinant of people's vulnerability to disasters. A study conducted by the Cambodian Red Cross has shown that poverty in Cambodia varies according to the geographical area, and that it is attributed to those people who are, in particular, vulnerable to floods and droughts. Some infrastructure development works, such as building roads without installing proper and sufficient culverts or bridges, can inundate and threaten agriculture crops.

Figure 3: Map of Areas vulnerable to soil erosion



Source: Roles of sustainable land management, MAFF 2012

Besides this, the unplanned patterns of human settlement and land use have led to dramatic increases in the population of people living in the Mekong floodplains. Irrigation systems and water conservation measures remain inadequate particularly in the face of increasing incidences of drought. Vulnerabilities to natural hazards are enhanced through the exposure of underlying factors of physical, social, economic and environmental vulnerabilities that prevent many people from living in safe conditions (SNAP, 2008-2013).

2. Policy Frameworks on DRR in Agriculture

There are several frameworks, strategic policies, and agreements, external and internal that shaped Cambodia's policies on DRR and agriculture, and consequently influenced the design of this sectoral plan of action for DRR in agriculture; these include namely:

2.1 Hyogo Framework for Action 2005-2015

The Hyogo Framework for Action (HFA) 2005-20015 was adopted by 168 countries; Cambodia is one of the signatory countries. The HFA is a solid legal framework for imparting knowledge on natural hazards and disasters and the implementation of disaster risk reduction measures around the globe. It sets out three strategic goals

and outlines five priorities for action, which cover the main areas of disaster risk reduction. The five priorities for action are:

- Ensure that disaster risk reduction (DRR) is a national and a local priority with a strong institutional basis for implementation
- Identify, assess and monitor disaster risks and enhance early warning
- Use knowledge, innovation and education to build a culture of safety and resilience at all levels
- Reduce the underlying risk factors
- Strengthen disaster preparedness for effective response at all levels

2.2 ASEAN Agreement on Disaster Management and Emergency Response

The ASEAN Agreement on Disaster Management and Emergency Response (AADMER) is a regional legally-binding agreement that binds South East Asian Nations (ASEAN) Member States together to promote regional cooperation and collaboration in reducing disaster losses and intensifying joint emergency response to disasters in the ASEAN region. AADMER is also ASEAN's affirmation of its commitment to the Hyogo Framework for Action (HFA). AADMER contains provisions on disaster risk identification, monitoring and early warning, prevention and mitigation, preparedness and response, rehabilitation, technical cooperation and research, mechanisms for coordination, and simplified customs and immigration procedures. The agreement has objectives to provide effective mechanisms to achieve substantial reduction of disaster losses in lives and in the social, economic and environmental assets of the Parties, and to jointly respond to disaster emergencies through concerted national efforts and intensified regional and international co-operation. This should be pursued in the overall context of sustainable development and in accordance with the provisions of this Agreement.

2.3 National Strategic Development Plan Updated 2009-2013

The National Strategic Development Plan (NSDP) has been developed to serve as the implementation tool and roadmap for the implementation of the Rectangular Strategy for Growth, Employment, Efficiency and Equity. The NSDP 2008-2013 (phase II) covers the period of the Fourth Legislature and the Rectangular Strategy. The plan recognizes that natural disasters such as floods, droughts, typhoons, and epidemic diseases cause losses of human lives, damage crops and properties as well as affect the national economy. The plan envisages addressing the underlying factors that make communities more and more vulnerable through sustainable interlinked development work.

2.4 Strategic National Action Plan for Disaster Risk Reduction 2008-2013

The Strategic National Action Plan for DRR 2008-2013 (SNAP) has been launched in 2008 to address the implementation of the Hyogo Framework for Action in Cambodia. An inter-institutional task force co-led by the National Committee for

Disaster Management (NCDM) and Ministry of Planning (MOP) has been formed to spearhead the formulation of the strategy.

The primary motivation of the Royal Government of Cambodia in the formulation of an Action Plan for Disaster Risk Reduction was to reduce the vulnerability of its people, especially the poor, to the effects of natural, environmental, and human-induced hazards. The Action Plan was conceived and formulated to serve as the "road map" or guide for strengthening and undertaking disaster risk reduction in Cambodia. Implementation of the activities and projects identified in the plan can contribute significantly to the attainment of the government's primary objective of poverty reduction. A strong emphasis is given towards strengthening sub-national capacities, particularly at the community level, to fully support the government priority of poverty reduction as elaborated in the national development plans and policies.

The document identified six key disaster risk reduction components for Cambodia:

- Ensure that disaster risk reduction is a national and a local priority
- Strengthen sub-national and community-based disaster risk management
- Identify, assess and monitor hazard risks and enhance early warning
- Use knowledge innovation and education to build a culture of safety and resilience
- Mainstreaming DRR into Policies and Programs of Relevant Government Ministries
- Strengthen disaster preparedness for effective response at all levels

2.5 National Adaptation Program of Action to Climate Change

The National Adaptation Program of Action to Climate Change (NAPA) was endorsed by the Council of Ministers of the Royal Government of Cambodia on October 20, 2006. The main goal of the Cambodian NAPA is to provide a framework to guide the coordination and implementation of adaptation initiatives through a participatory approach, and to build synergies with other relevant environment and development programmes. Cambodia's NAPA presents priority projects to address the urgent and immediate needs and concerns of people at the grassroots level for adaptation to the adverse effects of climate change in key sectors such as agriculture, water resources, coastal zone and human health. It encourages all concerned ministries and agencies to undertake their utmost efforts to integrate the priority projects identified in this National Programme into their respective sectoral plans.

2.6 Strategy for Agriculture and Water 2010-2013

This strategy, which was jointly developed by MoWRAM and MAFF, provides a single, transparent strategic framework that guides policy and planning processes in both ministries, and in various departments and sub-sectors. The strategy aims at improving agriculture production and productivity through sustainable use and management of water resources and at improving coordination amongst these two

ministries, as the institutional setting of the agriculture and water management sector is complex. This strategy serves the grass-root needs the most, because of the linkage of agriculture and water to rural affairs.

CHAPTER 3

POA'S FRAMEWORK FOR DRR IN AGRICULTURE

1. Vision, Mission, and Goal

Vision: Resilient farming communities withstand hazards and threats and are able to cope with disasters.

Mission: Minimize the impacts of disasters and climate change on agriculture and farmers livelihoods

Goal: To enhance capacities and resilience of farmers and communities to threats and disasters affecting agriculture and rural livelihood

2. Anticipated Outcomes and Indicators

2.1 Anticipated Outcomes

The plan envisages achieving the following outcomes:

- DRR, CCA, and SLM integrated into planning and activities of all relevant departments, institutions, and stations within GDA
- Farmers use Agromet and EWS information for decision making
- Documents on good practices to enhance agriculture resilience available and applied by farmers and widely shared
- Sub-national planner/extension workers proactively promote on resilient agriculture techniques
- Farmers are prepared to cope with hazards and receive timely emergency response in case that emergency status has been declared

2.1 Indicators

In general, the effectiveness of disaster risk reduction activities will be measured through the following indicators:

- Level of farmers satisfaction with agriculture extension services at all levels
- Perception of farmers on Agromet and Early Warning System (EWS) information services in agriculture
- Numbers of farmers applying good practice and resilient agriculture techniques
- % of agriculture sector contribution to Gross Domestic Product, with level of losses due to damage caused by hazards and disasters specified
- % of farmers in disaster prone areas affected by food insecurity after disasters had hit

3. Priority Framework

The Plan of Action is built in line with the Strategic National Action Plan for Disaster Risk Reduction 2008-2013 (SNAP) interpreted from Hyogo Framework for Action 2008-2015, and contributes to building the resilience of farmers and agriculture dependent communities to natural disasters through disaster risk reduction and climate change adaptation intervention in agriculture. The strategy framework for the plan consists of five priorities:

3.1 Priority 1: Strengthen institutional and technical capacities for disaster risk reduction and climate change adaptation in agriculture and enhance coordination mechanisms

Objectives: Ensure efficient institutional mechanisms and processes within GDA to address disaster risk reduction and climate change adaptation activities related to crop and sustainable land management and integrate them into other GDA development priorities.

Gaps to be addressed: Limited knowledge and capacities at both national and decentralized levels to program from the sectoral perspectives of agriculture and food and nutrition security, and implement projects and actions to address the emerging issues of disaster risk reduction/management and climate change adaptation; resource constraints within GDA to tackle disaster risk reduction and management; bottlenecks in inter-institutional coordination and collaboration.

Strategy: Strengthening institutional and technical capacities and mainstreaming disaster risk reduction, climate change adaptation, and sustainable land management within agriculture related policies, strategies and plans.

3.1.1 Strengthen institutional mechanisms for effective coordination of disaster risk reduction and climate change adaptation in GDA

3.1.2. Mainstream Disaster Risk Reduction, CCA and SLM into agriculture policies, strategies, plans

3.2 Priority 2: Promote and enhance early warning systems for pro-active disaster risk reduction and climate change adaptation

Objectives: Improve EWS and weather and climate information products customized to the needs of farmers, other DRR practitioner institutions and agriculture dependent communities.

Gaps to be addressed: Timely access to accurate Early Warning information including weather and climate information for agriculture application; weak outreach communication channels for delivery of EW information and weather and climate information to farmers

Strategy: (i) Coordinate with relevant departments and service providers to obtain relevant data and/or early warning products, and use/adapt them as appropriate for

the agricultural sector; this includes exchange of weather and climate information with DOM for tailor made applications in agriculture; (ii) enhance capacities of technical staff in GDA to interpret data and information and adapt it to specific needs of agriculture; (iii) improve communication channels and information flow to enhance outreach of sector specific early warning information to local level.

3.2.1 Establish and improve agriculture specific early warning systems in area of GDA's mandate

3.2.2 Improve, in coordination with other relevant stakeholders, the existing risks and vulnerability assessment methodologies from an agricultural perspective

3.3 Priority 3: Enhance knowledge management and innovation in support of disaster risk reduction and climate change adaptation in agriculture

Objective: Improve knowledge basis and communication for informed planning, evidence based decision making and information dissemination for disaster risk reduction, climate change adaptation and sustainable land management in agriculture.

Gaps to be addressed: The wealth of existing technical and indigenous knowledge promoting resilience of farmers' livelihood options is neither systematically analyzed nor documented; existing know-how on DRR in agriculture is not systematically validated and not widely disseminated. No field-based approaches are institutionalized to generate and disseminate innovation for DRR while blending it with indigenous knowledge. There are no strategies for up-scaling successful good practices nor for adapting good practices to location specific conditions and needs. Awareness among farming communities about the benefits and value added they can gain from proactive disaster risk reduction is very limited;

Strategy: Improved access to data, knowledge management and information dissemination applying enhanced communication and awareness raising strategies to raise understanding about options for and value added of disaster risk reduction and climate change adaptation measures.

3.3.1 Enhance DRR related databases to better inform planning and decision making

3.3.2 Enhance knowledge base, and promote innovation for DRR, CCA and SLM in agriculture

3.3.3 Awareness raising and communication for DRR, CCA, and SLM in agriculture

3.4 Priority 4: Reduce vulnerabilities to disasters by improving technical options and implementing community-based disaster risk reduction and climate change adaptation measures in agriculture

Objective: Increase livelihood resilience against disasters by enhancing capacities of technical staff and increasing options for farmers to implement a wide range of good practices to reduce hazard risk exposure, damages and losses, and by creating additional livelihood opportunities and risk transfer schemes

Gaps and shortcomings to be addressed: insufficient use of good practices that reduce underlying vulnerability of farming systems and farm families; need to change unsustainable practices that reduce short and or long term resilience like mono cropping, poor soil nutrient management, excessive uses of chemical fertilizers and pesticides, and poor application of water management and conservation practices.

Strategy: Promote the application and up-scaling of good practices for DRR and CCA

3.4.1 Promote integrated farming systems and crop diversification to build resilience of agriculture communities to disaster impacts

3.4.2 Reduce land degradation and erosion through community sustainable land management and interventions

3.4.3 Promote sustainable water management and conservation practices on farmer fields

3.4.4 Promote risk sharing and risk transfer mechanisms

3.4.5 Reduce adverse impacts of chemical fertilizers and pesticides in agriculture from national to local level

3.5 Priority 5: Strengthen effective preparedness and response capacities and the integration of disaster risk reduction and climate change adaptation into agriculture interventions

Objective: Enhancing the national, sub-national and local capacities for disaster preparedness for emergency response and recovery and ensure that disaster risk reduction and climate change adaptation activities are included into response and recovery interventions.

Gaps to be addressed: Disaster response in the agricultural sectors has largely been reactive rather than proactive in the past. Significant resources were regularly allocated for response and rehabilitation after natural disasters; however, their delivery is usually ad hoc in nature focusing on the immediate needs. Preparedness activities need to be institutionalized and systematically strengthened at all levels; response and recovery processes should be designed in a way that interventions provide new opportunities to integrate disaster risk reduction and climate change adaptation priorities considering a long term perspective also during response.

Strategy: Review, update and diversify existing preparedness measures to be more strategic and outline key measures like contingency planning, and operations of stock piling of key items for recovery, and strategic emergency reserves; facilitate long-term sustainable risk reduction and adaptation measures as part of response, recovery, and rehabilitation interventions.

3.5.1 Enhance capacity of GDA to conduct regular contingency planning and their integration in ongoing planning and activities

3.5.2 Enhance preparedness measures to improve effectiveness of emergency response and recovery actions in agriculture

4. Crosscutting Issues

The Plan of Action on disaster risk reduction considers three cross-cutting elements that should be part of all the priority actions outlined above.

4.1 Capacity Development

Consistent, programmatic support to institutional and technical capacity development is fundamental for the effective implementation of the above five priorities. The core areas of capacity development include research and development, technology transfer, tools and methods for assessment, agriculture and crops services, policy advocacy, awareness raising and mainstreaming.

4.2 Partnerships

Strategic partnerships are crosscutting and essential to promote an interdisciplinary approach towards implementing the priority actions. The Plan of Action will foster partnerships at all levels including among the other General Directorates and Administrations within MAFF, and with other Ministries, specifically MoWRAM, NCDM and research institutions like CARDI.

4.3 Gender Equity

The gender dimension is crucial in DRR and the agriculture sectors. Gender roles and relations affect food security, household welfare, and risk exposure; they are critical indicators for agriculture development; gender inequalities in access to and control over resources are persistently undermining the sustainable and inclusive development of the sector; women's leadership in key positions is still rare within the sectors. Integration and mainstreaming of gender priorities in all activities of the POA is essential to enhance overall long term resilience.

CHAPTER 4:

COORDINATION AND IMPLEMENTATION MECHANISM

1. Institutional Coordination Mechanism for the Implementation of the Plan of Action

The planning process initiated under the Plan of Action is designed as the start of an ongoing process of mainstreaming disaster risk reduction within key agencies and among sectoral stakeholders in DRR. In this spirit, the Plan of Action for DRR in GDA is a catalytic step that is expected to trigger wider outreach, to require follow up, and regular updating of the planning documents within GDA and MAFF.

1.1 Institutional Structure of GDA

The General Directorate of Agriculture is one of the Directorates/Administrations of the Ministry of Agriculture, Forestry, and Fisheries. GDA's mandate includes crop production and agriculture land resources management. The day-to-day affairs of GDA are managed by one Delegate of the Royal Government of Cambodia, and assisted by 4 Deputy General Directors. Within GDA, there are 9 departments including the Departments of Administration, Planning, Accounting, and International Cooperation (DAPAIC), Department of Rice Crop (DRC), Department of Horticulture and Subsidiary Crops (DHSC), Department of Industrial Crops (DIC), Plant Protection, Sanitary and Phytosanitary (PPSPSD), Department of Agricultural Land Resources Management (DALRM), Department of Agricultural Engineering (DAEng), Department of Agricultural Extension (DAE), and the National Agricultural Laboratory (NAL).

Currently, the Department of Agriculture Land Resources Management is the host for the Disaster Risk Reduction/Management and Climate Change Adaptation related component in GDA. The Director of the department is also a focal person and represents the GDA on climate change matters.

1.2 Institutional Arrangements for the implementation of the Plan of Action

Introducing new priorities and approaches in GDA which involve different stakeholders and departments requires consensus building, and an enhanced management and implementation structure. Thus the organizational features for the management of POA-DRR have been considered as follows:

1.2.1. Steering Committee

A Steering Committee will provide overall direction and oversight. The committee will be chaired by the Delegate of the Royal Government of Cambodia in charge of the GDA with the representatives of technical departments of GDA as members. The body will be accountable to GDA for the implementation and monitoring the progress of this POA.

1.2.2. Technical Working Groups

The Steering Committee will be backstopped by Technical Working Group composed of a group of selected experts from each technical department and stationed within GDA. The Technical Working Group will be led by one deputy General Director and will constitute 3 different Task Groups:

- Task Group-Capacity Building and Planning: will be in charge of capacity building to all relevant departments within GDA and to selected sub-national PDAs and communes. The Task Group ensures the integration of DRR and CCA into agriculture planning at all levels.
- Task Group-Assessment and Emergency Response: will be responsible for post disaster needs assessments, data collection, and update all information related to disaster losses and damages in the agriculture sector. The Task Group will be formed on ad hoc basis and could be re-activated and deployed within 24 hours after an emergency has occurred to initiate rescue and response actions
- Task Group-Resilient Agriculture: will be composed of technical representatives and experts. This task group will be responsible for combining sound technical knowledge of agriculture with regards to DRR and CCA concepts. In addition, this task group will be in charge of conducting research and the development of good practice options for resilient agriculture.

1.2.3. Secretariat

The Steering Committee and the Technical Working Group will be supported by a Secretariat, which serves as a coordinating unit that manages and reports on the progress of the POA implementation. Based on the mandate and responsibilities, the Department of Agriculture Land Resources Management is proposed to be the Secretariat for facilitating and coordinating related DRR and CCA interventions.

1.3 Funding and Resource Mobilization

Funding for the implementation of the action plan will be allocated from the national and local budgets. All the relevant departments and institutions/research stations are expected to implement their responsibilities under the Plan of Action and integrate these within their specific budgets.

Three sources of funding are studied: internal, external and innovative funding.

The internal sources of funding constitutes the financial sources that are raised from within Cambodia, which include current public budget, private sector funding, sub-national level funding and other sources of domestic funding. The GDA is expected to raise a significant amount of financial resources using national budget.

Existing external sources of funding include grants and loans which are provided by external country sources such as bilateral and multilateral donors, multinational corporations, charitable foundations, etc. These sources represent the "second door of financing" after the internal sources. In general, the magnitude is determined by the amount of resources the country is able to raise internally and the number and type of co-financers contributing to the same activity.

Innovative sources of funding represent new potential of non-traditional modes of financing. Recently, innovative financing mechanisms have increasingly been viewed as a stable and sustainable funding source that is not affected by changes in political dynamics or donor policies and modalities.

The innovative funding mechanisms potentially accessible for DRR work include funding mechanisms established under the United Nations Framework Convention on Climate Change, the Least Developed Countries Fund, Green Climate Fund or Adaptation Fund. Opportunities may also arise from payment mechanisms for environmental services, such as Reducing Emissions from Deforestation and Forest Degradation and Clean Development Mechanism.

1.4 Monitoring and Evaluation

The Steering Committee shall establish an overall Monitoring and Evaluation Plan for the POA for DRR. This will be based on the statement of intended outcomes and indicators in the previous sections. Appropriate and more specific indicators will be formulated in the monitoring and evaluation plan that will be developed as part of the implementation of the Plan of Action.

The Monitoring and Evaluation Plan shall provide guidance on how to track the progress of the POA and include information such as indicators, methods for information gathering, timing and utilization of information. There will be two sets of information to be produced: a) results and b) processes. Information on results will be useful for tracking effectiveness and efficiency of public investments in the POA and will be reported to Government and Donor partners as well as project implementers themselves.

On the other hand, information on processes refers to "how successful or unsuccessful activities were carried out and lessons learned by the various implementers of POA projects". This type of information will be shared "horizontally" among stakeholders (e.g. farming communities, government staff, NGOs, local authorities etc.) and will be part of knowledge management initiatives. Participatory methods for monitoring will be applied to ensure participation of primary stakeholders.

GDA will use their staff in collaboration with local communities, beneficiaries, and NGOs to monitor the POA. External support will be required for midterm and final evaluation.

2. Inter-institutional Collaboration for POA implementation

The main government and non-governmental institutions working in the areas of disaster management, climate change adaptation, weather and climate information, and decentralized planning and being the main partners in implementing this POA are:

2.1 Disaster Management

2.1.1 National Committee for Disaster Management

Cambodia has set up a comprehensive institutional structure to address DRR. The National Committee for Disaster Management (NCDM) provides the overall leadership

and coordination of DRR/M; all key ministries are involved. The structure of disaster management reaches down to sub-national and local level. It includes provincial committees for disaster management (PCDM), district committees for disaster management (DCDM), commune committees for disaster management (CCDM), and village disaster management groups (VDMG).

2.1.2 Joint Activities Group

JAG is an informal civil society network. It is emerged out of informal discussions with a number of International NGOs actively engaged in Disaster Management and Disaster Risk Reduction in Cambodia. It plays an important role in coordination, learning and information sharing for national and international NGOs and capacity development of various stakeholders in Cambodia. JAG is a forum to share information, promote best practices, and to plan and coordinate the DRR activities to which the NGOs are giving priority. In the event of a disaster, JAG also acts as a coordinating body to link emergency coordination forums with the DRR actors in order to improve the response. JAG sees itself as an intermediate mechanism to build the capacity of stakeholders to effectively manage disaster risks and mainstream DRR at both the national and sub-national level and to foster synchronized efforts towards capacity building of government, International Non-Governmental Organizations (INGO), national NGOs and other stakeholders. As of August 2013, the members of JAG are French Red Cross, Oxfam, ActionAid, Danish Church Aid/Christian Aid, Save the Children, Care, Concern, People in Need, Plan International, World Vision, Life with Dignity, and Caritas.

2.2 Climate Change Adaptation

2.2.1 Ministry of Environment

The ministry of Environment is the focal ministry for climate change and environmental matters. The ministry formulates and implements policies, plans and program related to the environment; carries out research on environment and technology and promotes alternative energy. The ministry leads climate change related activities and has led the preparation and coordination of the national adaptation program of action (NAPA). It also hosts the Cambodia Climate Change Alliance (CCCA), which is a comprehensive and innovative approach to address climate change in Cambodia. The Alliance includes a unified engagement point for development partners and a multi-donor financing facility to provide resources for climate change capacity building and implementation at national and local level. The Alliance is anchored in the government's National Climate Change Committee, which is the mandated government coordinating and policy support entity for all aspects of climate change. Since DRR is an incremental aspect of CCA, close collaboration between the ministry and NCDM is essential to ensure the integration of short and longer-term DRR and CCA initiatives.

2.2.2 Cambodia Climate Change Network

Cambodia Climate Change Network is made up of local and international NGOs, associations, and private sector organizations and individuals operating in Cambodia on climate change and climate change related issues. The Network envisions that Cambodia will have a well-informed and empowered population with a collective

voice to address climate change issues so that environmental sustainability is increased and marginalized people have stronger control over their lives and livelihoods. The Network believes that grass-root groups are most important since civil society voice requires a real and strong civil society.

2.3 Weather and Climate Information and Irrigation

The Ministry of Water Resources and Meteorology (MoWRAM) leads and manages water resources and meteorology sector of the Royal Government of Cambodia. The Ministry's responsibilities are closely related to agriculture, especially those of the general department of technical affairs, which includes the department of hydrology and river works, the department of irrigation and drainage, and the department of meteorology. As stated above, the ministry has jointly developed a water and agriculture strategy with ministry of agriculture, forestry, and fisheries to outline the area where these two ministries have to join hands and responsibilities as well as capacities of each ministry. It looks at correlations between water use and management, agriculture, and food and nutrition security, water resources and agricultural land management, agriculture and agri-business support including research, education, and extension.

1.4 Decentralized Disaster Management Planning

NCDM was established in 2008 as an inter-ministerial mechanism for promoting the democratic development through decentralization and deconcentration reforms throughout Cambodia. Housing at the Ministry of Interior, NCDD is accountable to the Royal Government of Cambodia for the implementation of the Law on Administrative Management of the Capital, Provinces, Municipalities, Districts and Khans (Organic Law), the Law on Administrative Management of Communes/Sangkats and Decentralization and Deconcentration policy. NCDD has established sub-committees and a Secretariat to facilitate and manage effective implementation of the Organic Law and the Commune/Sangkat law in line with the Decentralization and Deconcentration (D&D) policy.

Within its mandate, NCDD designs and implements the national program on democratic development at sub-national level in accordance with the Law on Administrative Management of Capital, Provinces, Municipalities, Districts and Khans, Law on Administrative Management of Communes/Sangkats and Law on Public Financial System. The Committee is considered as a power holder or the gate way to integrate DRR and CCA into sub-national and commune level planning and translate them into real practice and implementation.

Annex 1: Planning Matrix for Plan of Action for DRR in Agriculture 2014-2018

Strategic actions	Specific activities 2014-2018	Indicators	Year of Implementation					Respon-sible
			2014	2015	2016	2017	2018	
Goal: To enhance capacities and resilience of farmers and communities to threats and disasters affecting agriculture and rural livelihood								
Priority 1: Strengthen institutional and technical capacities for disaster risk reduction and climate change adaptation in agriculture and enhance coordination mechanisms								
1.1 Strengthen institutional capacity and mechanisms for effective coordination of disaster risk reduction and climate change adaptation in GDA								
1.1.1 Establish a focal point in GDA to coordinate and guide throughout GDA for the DRR/CCA matters and to deliver related technical tasks	1.1.1.1 Establish Secretariat to guide throughout GDA within GDA	Secretariat and Task Groups established with clear TORs	X	X				GDA
	1.1.1.2 Promote woman leadership within GDA in DRR and CCA	Number of women in the decision making position	X	X	X	X	X	GDA
	1.1.1.3 Provide logistic support to the GDA coordination mechanism for DRR, CCA, and SLM in GDA	Secretariat functioned with enough materials and equipment	X	X	X	X	X	DAPAIC
1.1.2 Strengthen capacity of technical units in GDA (including decentralized levels) and in selected agricultural research, partner institutions to address and include DRR and CCA issues	1.1.2.1 Establish national trainer team on DRR and CCA and SLM and capacitate them with adequate resources	A technical training unit is established for DRR, CCA, and SLM related works	X	X	X	X	X	DALRM
	1.1.2.2 Update TORs of selected staff to include DRR and CCA related responsibilities	New TORs for technical department/unit revised in inclusion of DRR and CCA roles and responsibilities	X	X				DAPAIC
	1.1.2.3 Develop training curriculum for DRR, CCA and SLM tailored to the situation and need of agriculture; and	Training manual on DRR, CCA, and SLM available for main agro-ecological zones	X	x	x	x	x	DAE DALRM

	design cost efficient training strategy							
	1.1.2.4 Develop specific planning policy/guideline/tools for integration of DRR,CCA, SLM into GDA's relevant department and selected disaster prone communes	Specific planning policy/guidelines/tools available	X	X	x	x	x	GDA
	1.1.2.5 Provide training to GDA technical departments, decentralized offices, research institutes, agriculture research stations on DRR, CCA and SLM and planning	Number of training programs conducted	X	X	x	x	x	GDA DALRM
	1.1.2.6 Conduct field study/exchange program on DRR and CCA for trainees and trainers (both inside and outside countries)	20 in-house exchange visits and 5 international exchange visits organized	X	X	x	x	x	DAPAIC DALRM
1.1.3 Enhance research and development with research institutes and agriculture research stations (research-extension) and their capacities for support to DRR, CCA and SLM	1.1.3.1 Conduct more applied research on hazard resilience of cropping and sustainable land management practices and systems (e.g. flood, drought, pest, salinity tolerant seeds/rice varieties) at selected research sites	New research projects on crop and land improvement prepared and implemented by GDA	X	X	x	x	x	DALRM DRC DHSC
	1.1.3.2. Conduct field demonstration on DRR technologies and integrated natural resource management and rehabilitation of degraded land at research institutes and agriculture research stations	At least 10 large demonstrations organized	X	X	X	X	X	DAEng DALRM
	1.1.3.3 Assist in capacitating selected agricultural research institutes to conduct, monitor, and analyze more site specific demonstrations at community level, in order to identify, validate and disseminate thereafter DRR and CCA good practices	At least 5 research stations conduct specific field demonstrations	X	X	X	X	X	DALRM DAE

1.1.4 Establish/ strengthen inter-institutional collaboration, coordination and information exchange, with other key stakeholders in DRR and CCA across sectors	1.1.4.1 Enhance coordination with other general directorates and administrations within the ministries and other stakeholders to deliver integrated DRR measures	Meetings regularly organized with other general directorates on a quarterly basis	X	X	X	X	X	DAPAIC DALRM
	1.1.4.2 Establish bilateral networking with Department of Irrigation of MoWRAM to strengthen collaboration with regard to water use management for DRR and CCA planning	An inter-institutional committee established to coordinate DRR, CCA, SLM interventions	X	X	X	X	X	DAPAIC DALRM
	1.1.4.3 Insist for re-activating an inter-ministerial committee on water and agriculture	Membership of GDA in inter-institutional committee	X	X	X	X	X	DAPAIC
	1.1.4.4 Ensure active membership of AG officers in PDMCs, DDMCs and CDMCs with the task to enhance coordination and complementary between DM-committees' and agricultural planning at all levels	Membership of GDA in technical working group	X	X	X	X	X	GDA
1.2 Mainstream Disaster Risk Reduction, CCA and SLM into agriculture policies, strategies, plans								
1.2.1 Update sustainable agriculture land management policy and agriculture land use plans in view of DRR and CCA and enforce for the endorsement	1.2.1.1 Include DRR aspects into agricultural land policy (law sub-decree, prakas, etc.), and sustainable agricultural land use strategy	Sustainable agriculture land management law endorsed	X	X				DALRM
	1.2.1.2 Integrate DRR, CCA, and SLM priorities into current and future sectoral and action plans of each technical unit	Number of agriculture technical units integrated DRR,CCA and SLM into their sectoral and action plans	X	X	X	X		DALRM DAE
1.2.2 Provide strategic and technical guidance for the development, and implementation thereafter, of DRR	1.2.2.1 Develop rules, Praskas, circulations, and regulations for implementing DRR as part of agriculture related law and policies	Rules, Prakas, Circulations, and regulations additionally developed	X	X	X	X	X	GDA

Policies and Plans for agriculture at decentralized levels	1.2.2.2 Update soil, water use, and fertilizer application manuals and other communication materials for agriculture in view of DRR issues to be included	Technical guidance and books for agriculture available	X	X	X	X	X	DAE DALRM
1.2.3 Promote inclusion of DRR and CCA issues, and SLM into the curricular of agriculture academic universities and institutes	1.2.3.1 Host/support researches/studies for agriculture academic university students on DRR, CCA and SLM in agriculture	Number of students conducted researches/study theses on DRR/CCA/SLM annually	X	X	X	X	X	GDA
	1.2.3.2 Conduct seminars/workshops to university students on DRR, CCA, SLM	Number of seminars/workshops organized for academic students annually	X	X	X	X	X	GDA
Priority 2: Promote and enhance early warning systems for pro-active disaster risk reduction and climate change adaptation								
2.1 Establish and improve agriculture specific early warning systems in area of GDA's mandate								
2.1.1 Enhance climate and weather information products and services tailored to the needs of Cambodian farmers	2.1.1.1 Set up/rehabilitate one Agro-met micro station located in agricultural research stations of each agro-eco-region in GDA, Kampong Cham, Prey Veng, Kampong Speu, and Battambang provinces	Number of research stations in disaster prone areas equipped with Agro-met stations with particular sensors for agriculture application			X	X	X	DALRM
	2.1.1.2 Establish bilateral networking with DOM/MoWRAM for regular transmission and interpretation of weather and climate information matching the technical parameters needed for the purpose of agricultural applications; (based on recommendations presented in the draft Agro-met strategy developed by DIPECHO project; with UNDP project follow up)	Weather and climate information and data regularly transmitted via internet/intranet for the use of GDA	X	X	X	X	X	DAPAIC DALRM
	2.1.1.3 Develop, build and update	A group of agro-met technical	X	X	X	X	X	DALRM

	capacity of technical Agro-met team within GDA and equip them with facilities and resources to translate climate and weather data into operational advice for agriculture	experts formed with clear TORs						
	2.1.1.4 Regularly develop agriculture specific weather and climate information and warning bulletins and timely disseminate to farming communities as decision support tool for crop selection and operational planning in line with cropping calendar	Number of Agro-met bulletin publications released		X	X	X	X	DALRM
2.1.2 Enhance agriculture related market and price information system and regular disseminate information	2.1.2.1 Develop and build capacity of technical team within GDA and equip them with facilities and resources to produce accuracy market price information for agriculture products	Farmers' satisfaction on market price information services	X	X	X	X	X	GDA
	2.1.2.2 Regularly disseminate products including through extension, radio, mass media and posting of relevant information at public places in hazard prone areas	Number of communities regularly receiving and discussing the EWS	X	X	X	X	X	DALRM
	2.1.2.3 Established farmer network for sharing information on market and price and other relevant DRR issues	Farmer network established	X	X	X	X	X	DALRM
2.1.3. Enhance Trans-boundary crop pest and disease monitoring and Early Warning system	2.1.3.1 Link to regional networks on the surveillance capacities and equipment for trans-boundary disasters (flood and pests and diseases)	Regional working group established			X	X	X	DAPAIC
	2.1.3.2 Strengthen national capacities and mechanisms for early pests and disease detection and early warning	Number of trans-boundary disasters detected		X	X	X	X	PPSPSD DAPAIC

2.2 Improve, in coordination with other relevant stakeholders, the existing risks and vulnerability assessment methodologies from an agricultural perspective								
2.2.1 Support to preparation of detailed hazards and disaster risks (including land degradation) and vulnerability maps for agriculture	2.2.1.1 Conduct hazard risk and vulnerability studies specific for agriculture sectors and share relevant information for adaptation planning and risk mapping	Result of analysis available for decision making at different levels		X	X	X		DALRM
	2.2.1.2 Develop pilot cropping calendars to reduce hazard and disaster risk for main agro-ecological regions	Crop calendar for main agro-eco system available	X	X	X	X	X	DRC DIC DHSC DALRM
	2.2.1.3 Develop agriculture zoning for low land areas to build resilience agriculture	A pilot cropping calendar and agriculture zoning developed	X	X	X	X	X	DALRM
Priority 3: Enhance knowledge management and innovation in support of disaster risk reduction and climate change adaptation in agriculture								
3.1 Enhance DRR related data bases to better inform planning and decision making								
3.1.1 Support to systematic collection of new data, and improved access to existing data relevant for DRR and CCA in agriculture	3.1.1.1 Conduct regular updates on agriculture sector database in view of DRR issues	Updated database available	X	X	X	X	X	DAPAIC
	3.1.1.2 Develop and maintain a website for GDA and link to other agriculture websites (MAFF, CARDI, CARD…)	Webpage for GDA established, linked to other agriculture websites and maintained			X	X	X	DAPAIC
	3.1.1.3 Promote development of agricultural land data base in all agro-ecosystems including data on risk exposure	Agricultural land use database available		X	X	X		DALRM
3.2 Enhance knowledge base, and promote innovation for DRR and CCA and SLM in agriculture								
3.2.1 Promote on	3.2.1.1 Promote field-based research on	Number of new action/field	X	X	X	X	X	DALRM

action-based research and field-based studies for the identification, validation and location specific adaptation of agricultural practices enhancing resilience to droughts, floods, storms and pests & diseases	combined techniques for resilient agriculture	research						DAE
	3.2.1.2 Promote research on specific rice crops tolerant to flood, drought, salinity, and pest and diseases	Number of tolerant rice crops released	X	X	X	X	X	DRC
	3.2.1.3 Develop recommendation on tolerant/resilient crops and crop zoning	Recommendation on tolerant crop varieties and zoning available		X	X	X	X	DALRM
	3.2.1.4 Develop information sharing strategy and extension materials on tolerant/resilient crops and crop zoning to relevant stakeholders	Local extension workers received information on a quarterly basis on resilient crops and zoning			X	X	X	DAE
3.2.2 Promote use of farmer field schools (FFSs) and demonstration farms/plots to disseminate knowledge on good practices for DRR	3.2.2.1 Review guideline and policies on FFS in views of DRR, CCA, and SLM	Guideline and policies on FFS reviewed	X	X	X	X	X	DAE
	3.2.2.2 Facilitate the formation of FFSs in hazard prone areas	Number of FFS established	X	X	X	X	X	DAE
	3.2.2.3 Disseminate technical information to farmers on DRR, CCA, and SLM	Farmers' satisfaction on agriculture extension services	X	X	X	X	X	DAE
	3.2.2.4 Provide trainings to model farmers on resilient agriculture practices	Number of trainings provided		X	X	X	X	DAE DALRM
3.2.3 Prepare and disseminate technical text books (to provide guidance) for extension workers, NGOs and farmers on recommended cropping and sustainable land management practices in context of DRR and CCA	3.2.3.1 Document good practice options for DRR in agriculture and upload them in the database	Number of good practices documented	X	X	X	X	X	DAE
	3.2.3.2 Document and contextualize technical text books in context of DRR and CCA for particular crops (rice, soybean, cassava…) for small and medium farmers	Technical text books available	X	X	X	X	X	DAE
	3.2.3.3 Publish and disseminate printed products (technical text books, GPs, posters…) to small farmers	Number of farmers received technical text books	X	X	X	X	X	DAE

3.2.4. Design and implement capacity development strategy on DRR agriculture good practices and their application	3.2.4.1 Conduct trainings with extension workers and NGOs to enhance local knowledge base on DRR good practices	Number of trainings provided	X	X	X	X	X	DALRM
	3.2.4.2 Promote implementation, test, and validation of DRR good practice options in agriculture (e.g. Dapog seedbed, common nursery, irrigation, seed selection, drought resilient techniques)	Number of farmers applied good practices	X	X	X	X	X	DRC
3.3 Awareness raising and communication for DRR, CCA, and SLM in agriculture								
3.3.1 Design and conduct local level awareness raising campaigns and training programs on lesson learnt and good practices of DRR, CCA and SLM	3.3.1.1. Conduct a representative needs assessment study in selected districts/communes to map information deficits and needs of farmers related to DRM and economic impacts of disasters in agriculture	Result of analysis available for decision making at different levels			X	X	X	GDA
	3.3.1.2 Develop field awareness program and disseminate lesson learnt and good practices of DRR, CCA, SLM through local existing channels (Extension workers, VAHW, Model Farmers) and through community activities (farm demonstration, farmer field day)	Number of awareness programs organized	X	X	X	X	X	DAE
3.3.2 Link famers to national and policy level to advocate on and to create awareness on DRR, CCA and SLM	3.3.2.1 Organize national platform for farmer competition on resilient agriculture practices	Number of national farmer platform organized	X	X	X	X	X	GDA
	3.3.2.2 Encourage exchange visits of farmers	Number of exchange visits of farmers organized	X	X	X	X	X	GDA
3.3.3 Disseminate	3.3.3.1 Share and upload information	Data and information on			X	X	X	DAPAIC

agriculture information on DRR, CCA, and SLM through mass media, mobile phones; newspapers, and printed bulletins	about agriculture sector on the MAFF/GDA website	agriculture available and uploaded on GDA's webpage						
	3.3.3.2 Develop/print/disseminate agro-met bulletins	Agro-met bulletins available for end users		X	X	X	X	DALRM
	3.3.3.3 Develop stand posters and information bill boards on DRR, CCA and SLM in hazard prone areas	Number of community bill boards installed		X	X	X	X	DALRM
	3.3.3.4 Collaborate with media and journalists to better inform about DRR, CCA, and SLM in agriculture	Number of journalists oriented on DRR, CCA, and SLM in agriculture	X	X	X	X	X	DAE
Priority 4: Reduce vulnerabilities to disasters by improving technical options and implementing Community-Based Disaster Risk Reduction and Climate Change Adaptation measures in agriculture								
4.1 Promote integrated farming systems and crop diversification to build resilience of agriculture community to disaster impacts								
4.1.1 Encourage practices on combined cropping techniques	4.1.1.1 Encourage use of water saving techniques including DRIP irrigation systems and plastic mulches for cropping	Number of farmers applied good practices	X	X	X	X	X	DHSC
	4.1.1.2 Encourage leveling of paddy fields	Number of farmers applied good practices	X	X	X	X	X	DAEng
	4.1.1.3 Encourage use of IPM	Number of farmers applied good practices	X	X	X	X	X	PPSPSD
	4.1.1.4 Develop technical guidelines, publication, and extension material related to DRR	Number of documents published		X	X	X	X	DAE
4.1.2.Encourage practices (crop diversification, crop rotation and covering crops) to reduce soil nutrient loss	4.1.2.1 Encourage pre/post-monsoon cropping in rice fields	Number of farmers applied good practices	X	X	X	X	X	DRC
	4.1.2.2 Encourage the use of rice-fish and rice-duck practices and integrated production systems more resistant to climate related risks	Number of farmers applied good practices	X	X	X	X	X	DALRM

	4.1.2.3 Promote household integrated farming in Banteay Meanchey, Battambang, Kampong Speu, Prey Veng, Svay Rieng, and Takeo provinces	Number of farmers applied good practices	X	X	X	X	X	DHSC
4.2 Reduce land degradation and erosion through community sustainable land management and intervention								
4.2.1 Promote sustainable soil management (organic farming, community biodiversity management, integrated nutrient management)	4.2.1.1 Promote Community based agriculture soil conservation in Srae Ambel district, Koh Kong province	Number of farmers involved	X	X	X	X	X	DALRM
	4.2.1.2 Promote study and exchange visit on best practices	Number of exchange visit organized	X	X	X	X	X	GDA
	4.2.1.3 Promote the use of organic fertilizers to enhance soil fertility	Number of farmers applied techniques	X	X	X	X	X	DALRM
	4.2.1.4 Encourage soil amendment by using agricultural waste to produce Biochar (rice husk, rice straw, bamboo, wood ….etc.) in 8 provinces	160 Biochar devices provided to farmer groups in 8 provinces	X	X	X	X	X	DAEng
4.2.2 Encourage practices for reducing soil erosion risks and nutrient loss	4.2.2.1 Conduct non-tilling farming to reduce soil degradation for high slop areas	Number of farmers applied techniques	X	X	X	X	X	DALRM
	4.2.2.2 Promote cover crop systems to reduce the soil degradation	Number of farmers applied techniques	X	X	X	X	X	DALRM
	4.2.2.3 Encourage field demo on land preparation for upland crop in 8 provinces	48 field demos were conducted in 8 provinces	X	X	X	X	X	DAEng
	4.2.2.4 Organize and promote contest for best practitioners	Number of competitions organized		X	X	X	X	DAE
	4.2.2.5 Organize workshops for sharing best practices related to DRR	Number of workshops organized	X	X	X	X	X	DAE
4.3 Promote sustainable water management and conservation practices on farmer fields								
4.3.1 Promote on-farm conservation and	4.3.1.1 Promote planting techniques and watering systems	Number of farmers applied techniques	X	X	X	X	X	DHSC

management practices for supporting vulnerable community (water harvesting schemes, multi-use water system and technology)	4.3.1.2 Increase irrigation coverage where water resources are available without negative impacts on ground water	Number of hectares of drainage-coverage rice field		X	X	X	X	DALRM
4.3.2 Improve water harvesting technique, water productivity and drought management in drought prone areas	4.4.2.1 Promote excavation of ponds, and small scale irrigation system	Number of ponds and small scale irrigation schemes rehabilitated	X	X	X	X	X	DALRM DAEng
	4.4.2.2 Promote knowledge of community in keeping water during the excess period for the late wet season	Number of farmers applied techniques	X	X	X	X	X	DALRM
	4.4.2.3 Enhance water management through laser land leveling and levee improvement	Rice fields of 990 ha leveled and levee of 990 ha improved in 8 provinces	x	x	x	x	x	DAEng
4.4 Promote risk sharing and risk transfer mechanisms								
4.4.1 Assess scope and feasibility for risk transfer mechanism in agriculture sector and develop strategy tailored to the needs of medium and small farmers	4.4.1.1 Conduct inventory and review of available insurance mechanism for crops, saving, and credit, and subsidy schemes in agriculture	Inventory available	X	X				DAPAIC
	4.4.1.2 Support the development of risk transfer mechanism (agro insurance, subsidy schemes) policies in view of DRR and CCA	Risk sharing/transfer mechanism established	X	X	X			DAPAIC
4.4.2 Promote and extend the formation of community agricultural cooperatives, community seeds/rice banks, and community	4.4.2.1 Capacity building to PDAs and NGOs about agriculture cooperatives law	Number of training organized	X	X	X			GDA
	4.4.2.2 Coordinate with NGOs and other institutions to establish agriculture cooperatives, rice/seeds banks, FFSs	Number of new farmer cooperatives established		X	X	X	X	GDA

safely net in hazards prone areas	4.4.2.3 Promote improvement of strategic seed banks and seeds storage systems at community level	Number of community banks stock piled seeds	X	X	X	X		DRC
4.5 Reduce adverse impacts of chemical fertilizers and pesticides in agriculture from national to local level								
4.5.1 Enforce law application and quality controls on chemical fertilizers, herbicides, and pesticides	4.5.1.1 Enforce the application of law, Prakas and Circulation and other regulations relating to chemical fertilizers and pesticides and their uses from national to local level	Monitoring conducted on a quarterly basis	X	X	X	X	X	PPSPSD DALRM
	4.5.1.2 Restrict on quality control of chemical fertilizers and pesticides (expired dates, quality and composition, effect…)	Monitoring conducted on a quarterly basis	X	X	X	X	X	PPSPSD DALRM
4.5.2 Enhance capacities and promote awareness raising amongst suppliers down to users about impacts of fertilizers/ pesticides/herbicides	4.5.2.1 Enhance capacities of chemical fertilizers and pesticides distributors, sellers, and farmers on technical utilization and impacts of chemical fertilizers and pesticides	Farmers' perception on agriculture extension services	X	X	X	X	X	PPSPSD DALRM
	4.5.2.2 Conduct public awareness raising on impacts of chemical fertilizers and pesticides/herbicides	Number of awareness programs organized	X	X	X	X	X	PPSPSD DALRM
Priority 5: Strengthen effective preparedness and response capacities and the integration of disaster risk reduction and climate change adaptation into agriculture interventions								
5.1 Enhance capacity of GDA to conduct regular contingency planning and their consideration in ongoing planning and activities								
5.1.1 Enhance capacity of departments of GDA to be able to provide timely response to emergencies in agriculture sector	5.1.1.1 Develop a contingency plan in line with national Emergency, Preparedness, Response Plan (EPRP)	Contingency plan for GDA available	X	X				GDA
	5.1.1.2 Conduct contingency planning exercises in hazard prone areas and identify the practices to facilitate	Number of simulation exercises organized within 5 years	X	X	X	X	X	DAPAIC

	preparedness and response							
5.1.2 Strengthen capacities to integrate DRR, CCA and SLM into preparedness, response and recovery project	5.1.2.1 Mainstream DRR and CCA concepts into recovery and rehabilitation projects of GDA	Proportion of GDA's recovery and rehabilitation projects contain integrated DRR and CCA concepts	X	X	X	X	X	GDA
	5.1.2.2 Build capacities of selected commune authorities in hazard prone areas on resilient agriculture technique/combined agriculture techniques	Number of communes trained on resilient agriculture	X	X	X	X	X	DALRM DAE
	5.1.2.3 Provide technical support to selected communes to be able to integrate at all times resilient agricultural techniques into their recovery planning	Number of communes have integrated resilient agriculture in their plans	X	X	X	X	X	DALRM DAE
5.2 Enhance preparedness measures to improve effectiveness of emergency response actions in agriculture								
5.2.1 Preserve seeds and fertilizers and pesticides and other agriculture inputs at GDA and at its research institutes and stations	5.2.1.1 Stock piling of rice seeds (short term and non-seasonal varieties) at research stations for flood/drought response and recovery	Quantity of rice stock-piled at each station	X	X	X	X	X	GDA
	5.2.1.2 Stock piling of crops seeds at research stations for post-flood/drought recovery	Quantity of vegetable seed stock-piled	X	X	X	X	X	DHSC
	5.2.1.3 Standby machineries at research stations for prompt rescue (plowing, pumping, harvesting machines)	Tractors 30 units, water pump 50 units and combine harvesters 10 units, and fuel available for emergence intervention	X	X	X	X	X	DAEng
	5.2.1.4 Stock piling of pesticides for BPP and Hoppers and ready to intervene	Quantity of agriculture pesticides stock-piled	X	X	X	X	X	PPSPSD
	5.2.1.5 Promote turn over mechanism of agriculture stock piling of	Annual refreshment of stock piling	X	X	X	X	X	GDA

	rice/vegetable seeds, fertilizers and pesticides for effective response and recovery							
5.2.2 Promote and strengthen the protocols for emergency situation in agriculture	5.2.2.1 Motivate to allocate and maintain emergency fund for response and recovery in agriculture sector and pilot it in 10 districts prone to drought and floods	At least 10 vulnerable districts allocated budget for emergency response in agriculture	X	X	X	X	X	DAPAIC
	5.2.2.2 Strengthen capacities of an assessment team within GDA and promote institutional cooperation, connecting to NCDM and other relevant stakeholders	Assessment and response team established with clear TORs	X	X	X	X	X	GDA
	5.2.2.3 Strengthen Standard Operating Procedures, protocols, and assessment formats and tools in place with NCDM and other stakeholders	Tools and procedures standardized	X	X	X	X	X	DAPAIC

Annex 2: Priority Activities for 2014-2018

Expected Output	Specific activities for 2014-2018	Place	Year of Implementation					Budget (USD)	Respon-sible
			2014	2015	2016	2017	2018		
Guidelines on combating land degradation established and widely shared	Encourage practices for reducing soil erosion risks and nutrient loss	KPS, SVG, KCN, TKE, PVG, PVH, BMC	X	X	X	X		1,200,000	DALRM and DAEng
Agro-met bulletin developed and widely disseminated to farmers and agriculture dependent communities	Set up/rehabilitate one micro Agro-met station located in agricultural research stations	KCH, KPS, SVR and BTB			X	X	X	100,000	DARLM
	Develop and build capacity of technical Agro-met team within GDA and equip them with facilities and resources to translate climate and weather data into operational advice for agriculture	GDA level		X	X	X	X	100,000	DARLM
Cropping calendar used as an operational advice for making decisions on cropping	Develop pilot cropping calendars for main agro-ecological regions		X	X	X			370,000	GDA
Food production enhanced through agricultural diversification	Encourage the pre and post-monsoon cropping in rice fields	TKE, PVG, SVG	X	X	X			120,000	DHSC
Nutrition for small farmer households improved	Promote household integrated farming	BMC, BTB, KPS, PVG, SVG, KTE, TKE	X	X	X	X	X	2,500,000	DHSC
Agricultural aspects in commune plans effectively implemented to address needs of small farmers	Build capacities of selected commune authorities in hazard prone areas on resilient agriculture techniques and combined agriculture techniques (drought and flood)	PVG, SVG, KPS, KTH, PVH, OMC		X	X	X	X	250,000	DAE
Self-response capacity to emergency in agriculture of line departments of GDA developed	Enhance the capacity of the GDA departments to be able to timely respond to emergencies in agriculture sector	GDA level	X	X	X	X	X	170,000	GDA

Annex 3: Summary of Plan of Action for DRR in Agriculture 2014-2018

Goal: To enhance capacities and resilience of farmers and communities to threats and disasters affecting agriculture and rural livelihood

Anticipated Outcomes

1. DRR, CCA, and SLM integrated into planning and activities of all relevant departments, institutions, and stations within GDA
2. Farmers use Agro-met and EWS information for decision making
3. Good practices to enhance agriculture resilience are known and applied by farmers and widely shared
4. Sub-national planner/extension workers proactively promote on resilient agriculture technique
5. Farmers are prepared to cope with hazards and received timely emergency response in case that emergency status has been declared

Strategic Objectives

Strengthen institutional and technical capacities for DRR and CCA in agriculture and enhance coordination mechanisms	Promote and enhance early warning systems for pro-active DRR and CCA	Enhance knowledge management and innovation in support of DRR and CCA in agriculture	Reduce vulnerabilities to disasters by improving technical options and implementing CBDRR and CCA in agriculture	Strengthen preparedness capacities for effective response and integration of DRR and CCA into agriculture interventions
↓ Strengthen institutional mechanisms for effective coordination in GDA ↓ Mainstream DRR, CCA and SLM into agriculture policies, strategies, plans	↓ Establish and improve agriculture specific early warning systems in area of GDA's mandate ↓ Improve, in coordination with other relevant stakeholders, the existing risks and vulnerability assessment methodologies from an agricultural perspective	↓ Enhance DRR related data bases to better inform planning and decision making ↓ Enhance knowledge base, and promote innovation for DRR, CCA and SLM in agriculture ↓ Awareness raising and communication for DRR, CCA, and SLM in agriculture	↓ Promote integrated farming systems and crop diversification to build resilience of agriculture communities to disaster impacts ↓ Reduce land degradation and erosion through community SLM and intervention ↓ Promote sustainable water management and conservation practices on farmer fields ↓ Promote risk sharing and risk transfer mechanisms ↓ Reduce adverse impacts of chemical fertilizers and pesticides in agriculture from national to local level	↓ Enhance capacity of GDA to conduct regular contingency planning and their consideration in ongoing planning and activities ↓ Enhance preparedness measures to improve effectiveness of emergency response and recovery actions in agriculture

Cross-cutting Issue

Capacity Development	Partnership	Gender Equity

Annex 4: Definitions

Adaptation means the adjustment in the natural or human system in response to actual or expected climatic stimuli or their effects, which moderates harm and exploits beneficial opportunities.

Climate Change – Change observed in the climate on a global, regional or sub-regional scale caused by natural processes and/or human activity. Climate change adaptation is an adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities.

Disaster – A serious disruption of the functioning of a community or a society, causing widespread human, material, economic or environmental losses that exceed the ability of the affected community/society to cope using only its own resources. Disasters are often classified according to their cause (natural or manmade).

Disaster Risk Management and Disaster Risk Reduction: Disaster Risk Management is a continuum of processes and actions related to Prevention, Mitigation, Preparedness, Response, Rehabilitation, and Reconstruction. Disaster Risk Reduction is a subset of DRM developing capacities and promoting policies, processes and actions with a focus on prevention, mitigation and better preparedness for response.

I. Prevention:

Measures taken for the purpose of preventing natural or man-made phenomena from causing or giving rise to disasters or other emergency situations

II. Mitigation

Measures taken to reduce the loss of life, livelihood and property by disasters, either by reducing vulnerability or by modifying the hazard where possible

III. Preparedness

Measures taken to reduce the impact of disasters through the prior organising of systems to promptly and efficiently respond to them. Preparedness addresses actions in both the pre-disaster phase, for example, warning and evacuation, as well as the post-disaster phase.

IV. Response

Actions carried out in a disaster situation with the objective to save lives, alleviate suffering and reduce economic losses.

V. Rehabilitation

The short-term repair of physical, social and economic damage – basically enough to get back on one's feet.

VI. Reconstruction

The medium- and long-term repair of physical, social and economic damage, and the return of affected structures to a condition equal to or better than before the disaster.

Disaster Risk Management (DRM) - The systematic process of using administrative decisions, organization, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters. This comprises all forms of activities, including structural and non-structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards (UN ISDR).

Disaster risk reduction (DRR) - Activities to minimize vulnerabilities and disaster risks throughout a society, to avoid (prevention) or to limit (mitigation and preparedness) the adverse impacts of hazards, within the broad context of sustainable development. DRR involves: (i) Risk awareness and assessment; (2) Knowledge development; (3) Public commitment and institutional frameworks; (4) application of multitude of measures, (5) Early warning systems, preparedness measures and reaction capacities (UN ISDR).

Hazard – A potentially damaging physical event, phenomenon and or human activity, which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation.

Natural Hazard – Natural processes or phenomena occurring in the biosphere that may constitute a damaging event.

Resilient Agriculture – Agriculture technical process and approach that strive to maintain system functionality and therefore, food system outcomes. Such resilience lessens acute, seasonal, cyclical and chronic variations in food security system (Dr. Jean-Charles Le Vallée).

Risk – The probability of harmful consequences, or expected loss (of lives, people injured, property, livelihoods, economic activity disrupted or environment damage) resulting from interactions between natural or human induced hazards and vulnerable conditions. Conventionally, risk is expressed by the equation Risk = Hazard x Vulnerability (UN ISDR)

Strategy is a broad plan of action that is implemented through policies and measures. Strategies can be comprehensive (i.e. focusing on national, cross sectional levels) or targeted (i.e. focusing on specific sectors, regions or measures).

Sustainable Development – Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Uncertainty is an expression of the degree to which a value (e.g. the future state of the climate system) is unknown.

Vulnerability – A set of conditions and processes resulting from physical, social, economic, and environmental factors, which increases the susceptibility of a community to the impact of hazards.

Annex 5: Hyogo Framework for Action 2005-20015

The Hyogo Framework of Action 2005-2015 (HFA) is the consensus strategy adopted by 168 member countries in the UN World Conference on Disaster Reduction in January 2005 in Kobe in order to spearhead the task of disaster risk reduction globally. The HFA 2005-2015 was developed based on the gap analysis in the national and global efforts in DRR in the preceding decade from 1994-2004.

The goals set by the HFA 2005-2015 are: a) Integration of disaster risk reduction into sustainable development policies and planning, b) Development and strengthening of institutions, mechanisms and capacities to build resilience to hazards, and c) Systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recovery program. It recommends five priorities for Action:

- HFA Priority Action 1: Ensure that disaster risk reduction (DRR) is a national and a local priority with a strong institutional basis for implementation.
- HFA Priority Action 2: Identify, assess and monitor disaster risks and enhance early warning.
- HFA Priority Action 3: Use knowledge, innovation and education to build a culture of safety and resilience at all levels.
- HFA Priority Action 4: Reduce the underlying risk factors.
- HFA Priority Action 5: Strengthen Disaster preparedness for effective response.

Cambodia has expressed its commitment to DRR by signing the HFA 2005-2015. Cambodia has already prepared the SNAP 2008-2013, developed National Action Plan for DRR 2014-2018 and outlined the strategy for disaster risk reduction.

Annex 6: List of Planning Development Committee

N	Name	Designation	Organization
01	H.E So Khan Rithykun	Delegate of the Royal Government in Charge of Director General of the General Directorate of Agriculture	GDA
02	Mr. Srun Sokhom	Deputy General Director	GDA
03	Miss. Chan Phalloeurn	Deputy General Director	GDA
04	Dr. Pheav Sovuthy	Director	DALRM
05	Dr. Koy Ra	Deputy Director	DALRM
06	Mr. Am Phirum	Deputy Director	DALRM
07	Mr. Om Pich	Deputy Director	DAPAIC
08	Mrs. Chhor Kimhoang	Technical Staff	DAPAIC
09	Mr. Tan Chantara	Technical Staff	DALRM
10	Mr. Keb Poch	Technical Staff	DALRM
11	Mr. Hou Chan Sython	Technical Staff	DALRM
12	Mr. Ung Soeun	Technical Staff	DALRM
13	Mr. Veasna Chhaya	Technical Staff	DALRM
14	Ms. Mann Mara	Technical Staff	DALRM
15	Ms. Tuy Sokkheng	Technical Staff	DALRM
16	Dr. Stephan Baas	Natural Resources Officer	FAO
17	Dr. Yuji Niino	Land Management Officer	FAO
18	Mr. Loek Sothea	National Project Coordinator/Technical Advisor	FAO

References

1. Cambodian Agriculture Research and Development Institute (CARDI). 2013. Golden Apple Snail and Management, Farmer Notes, July 2013.
2. Cambodian Center for Study and Development in Agriculture (CEDAC). 2005. Assessment of local authorities and communities practices and information needs to face disasters Report from surveys in Ba Phnom and Peam Ro districts, Prey Veng province, Cambodia, a Working Paper. Nov. 2005
3. FAO/IPC. 2007. Final Report on IPM for Vegetables and TCP/310/CMB.
4. FAO/WFP. 2012. Crop and Food Security, Update Mission to Cambodia Report, FAO/WFP, 17 April 2012. http://documents.wfp.org/stellent/groups/public/documents/ena/wfp247059.pdf
5. National Committee for Disaster Management and Ministry of Planning, Royal Government of Cambodia. 2008. Strategic National Action Plan on Disaster Risk Reduction 2008-2013.
6. National Committee for Disaster Management (NCDM). 2010. Post Ketsana Disaster Needs Assessment, Part I: Main Report, March 2010National Committee for Disaster Management (NCDM). 2013. *Flood Assessment Report*, December 2013.
7. Ministry of Agriculture and Cooperatives, Government of Nepal. April 2011. Priority framework for action 2011-2020, Climate Change Adaptation and Disaster Risk Management in Agriculture
8. Nobleman, M. T. 2003. Cambodia. Mankato, Minn: Bridgestone Books. p. 7. ISBN 9780736813709Ministry of Agriculture, Forestry, and Fisheries (MAFF). 2012. Roles of sustainable land management, Complement agreement in Agriculture in Cambodia.
9. Mekong River Commission. 2011. Technical Paper, Flood Situation Report 2011, No 36, , Nov. 2011
10. UNDP, Human Development Report 2013, The Rise of the South: Human Progress in a Diverse World