ADAPTATION FUND

DATE OF RECEIPT:

ADAPTATION FUND PROJECT/PROGRAMME ID:

(For Adaptation Fund Board Secretariat Use

PROJECT PROPOSAL

PART I: PROJECT/PROGRAMME INFORMATION

Project/Programme Category:	**Regular**
Country:	**Indonesia**
Title of Project/Programme:	**Adapting to Climate Change for Improved Food Security in West Nusa Tenggara Province**
Type of Implementing Entity:	**Multilateral Implementing Agency**
Implementing Entity:	**World Food Programme**
Executing Entities:	**Provincial Government of West Nusa Tenggara** **National Development Planning Agency (BAPPENAS)**
Amount of Financing Requested:	**US$ $ 5,940,375 (over 4 years)**

PROJECT BACKGROUND AND CONTEXT:

West Nusa Tenggara (Nusa Tenggara Barat - NTB) is one of the poorest provinces in Indonesia with 18.63% of households considered very poor (BPS, 2012). NTB's Human Development Index (HDI) (2012) ranks 32 out of 33 provinces in Indonesia. Indonesia's HDI as a whole is that of a middle-income country, while NTB's (at 64.66%) is that of a least developed country. NTB is also a priority on the national development agenda (Master Plan of Acceleration of Indonesian Economic Development, or MP3EI), focused on food security and tourism.

Livelihoods in NTB are overwhelmingly dependent on agriculture. More than 90% of household income in the province is derived from agriculture, the majority of which is rain-fed and low technology. The ratio between rain-fed and irrigated areas is 2.5 to 1 (Crop and Horticultural Division of NTB Agriculture Office, 2012), but approximately 60% of the irrigation facilities are damaged (NTB Public Works Office, 2012). As a result, climate variability and extreme climatic events such as floods and droughts have a significant impact on agricultural production and food security.

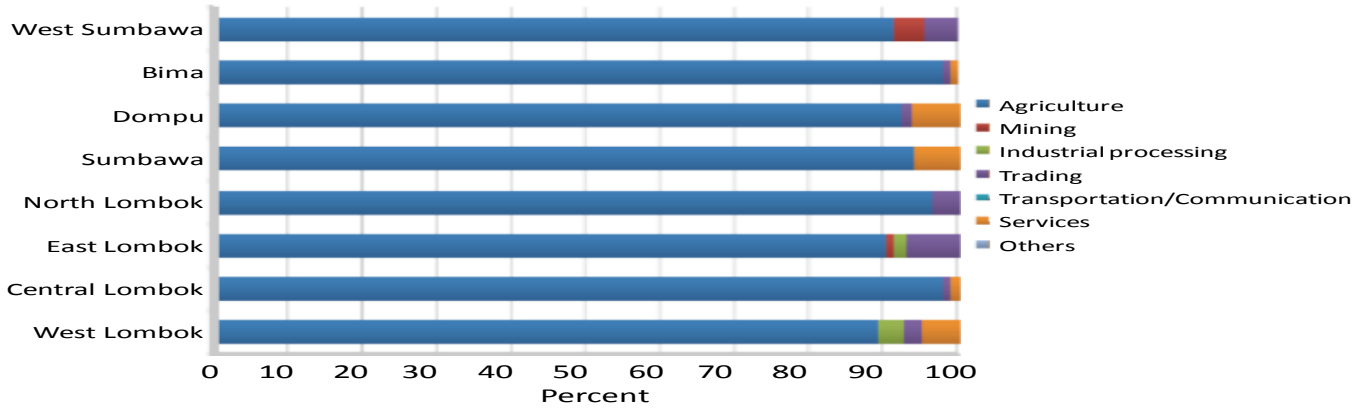


Figure 1. Source of income by sector in West Nusa Tenggara (NTB Provincial Government, 2011)

Climate variability in NTB, like other Indonesian regions with monsoonal rainfall, is influenced to a significant degree by the El Niño and Southern Oscillation (ENSO; Figure 2). El Niño conditions correspond result in a delayed onset of the rainy season, longer dry spells and less rainfall, while La Niña conditions correspond to excessive rainfall (Boer and Subbiah, 2005; ADB and Bappenas, 1999 and Quinn et al., 1978).

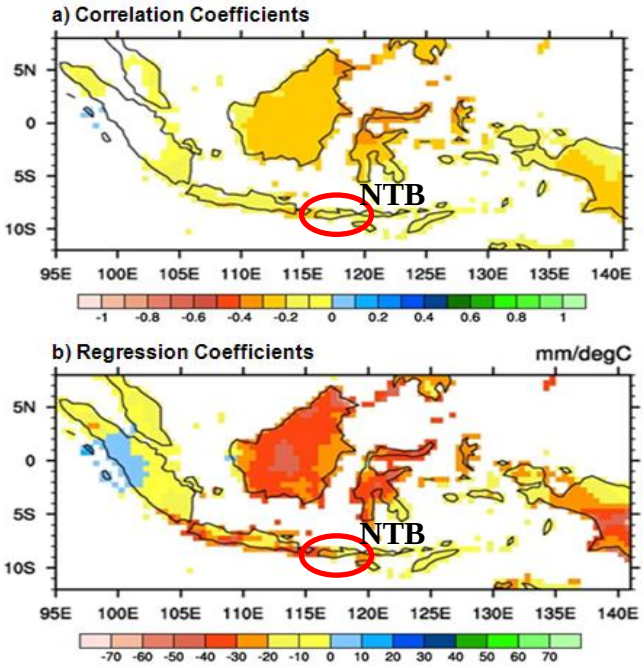


Figure2. ENSO impacts on rainfall variability in Indonesia represented by significant a) correlations coefficients, and b) regression coefficients between rainfall and sea surface temperature anomaly in Niño-3.4 region (Source: National Action Plan on Climate Change Adaptation, 2012)

Some scientists (e.g. Timmerman *et al.,* 1999) affirm that an increase in greenhouse gases will result in "more frequent El Niño-like conditions and stronger cold events (la Niña)". Recent analysis from NOAA (2007), shows that the majority of the 10 strongest El Niño events of this century occurred after the 1970s. As a result, the extreme regional weather and climate anomalies associated with El Niño may be exacerbated by increasingly higher temperatures (Hansen *et al.* 2006).

Indonesia's Second National Communication identifies NTB as priority province for climate change adaptation because of the high risks from climate change faced by the province. Crop failure due to extreme climate events may become more frequent. The frequency of massive drought in the country increased over the last 40 years compared to the previous decade - from once in three to four years to once in two to three years (Boer and Subbiah, 2005). Similar observations have been made for floods. Historical data from 1989-2008 shows that rice crop failures due to drought increase significantly during El Niño years, particularly in Central Lombok district, while floods commonly occur in Sumbawa and Bima districts (Figure 3 and 4).

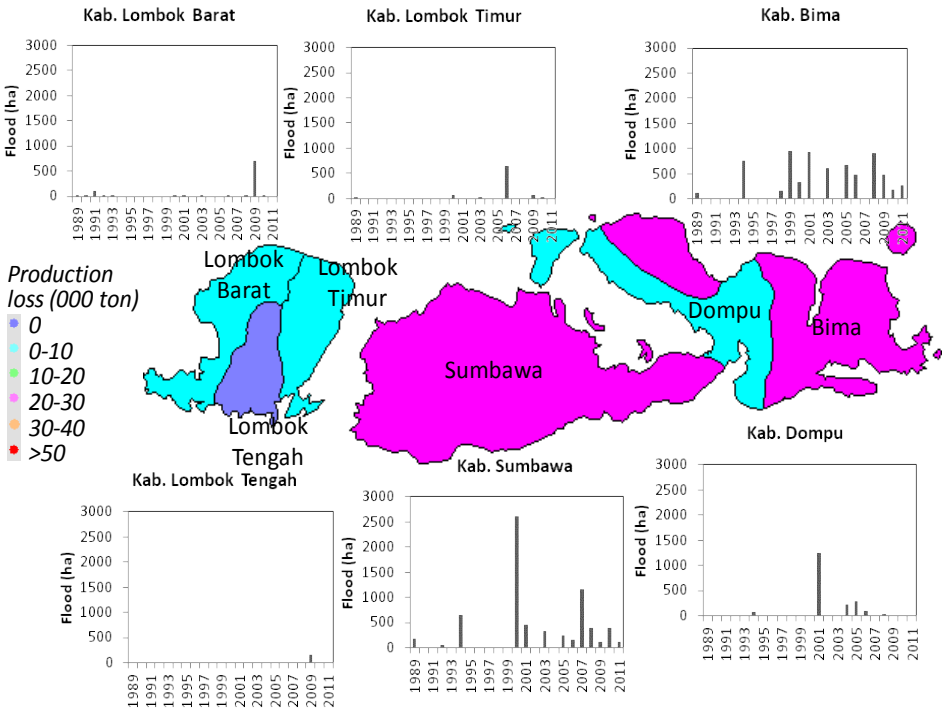


Figure 3. Cumulative affected area and estimated production loss due to floods in NTB from 1989-2008 (based on data from Directorate of Plant Protection, Ministry of Agriculture)

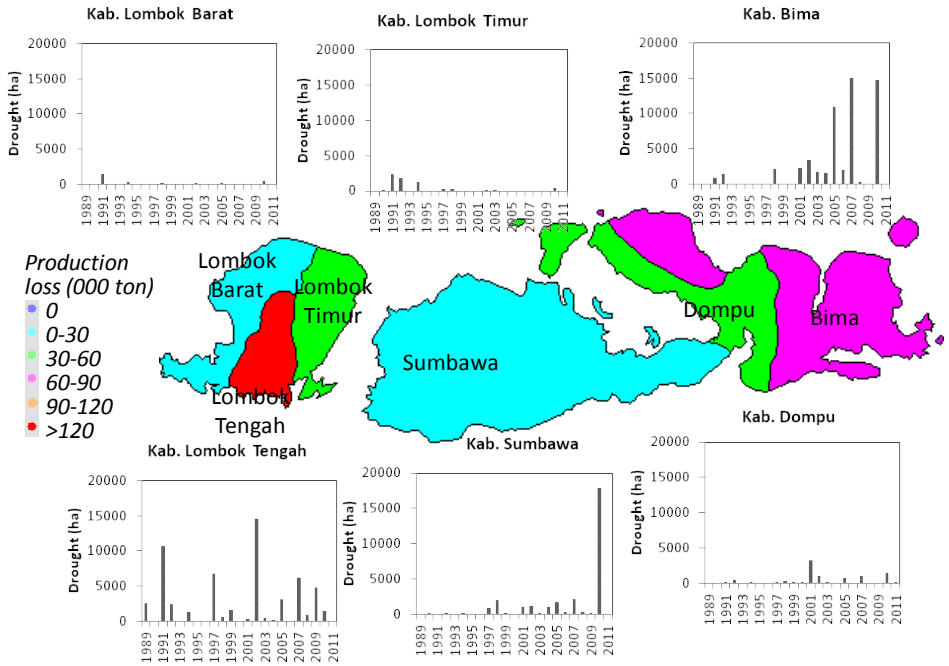


Figure 4. Cumulative affected area and estimated production loss due to drought in NTB from 1989-2008 (based on data from Directorate of Plant Protection, Ministry of Agriculture)

A trend of increasing mean temperature has already been observed in Indonesia. In the period between 1965 and 2009, the rate of mean temperature increase was about 0.016^{0}C per year (Figure 5). In NTB, in the period of between 1972 and 2010, the mean temperature has increased by about 0.5^{0}C (Figure 6). The US Global Change Research Program (USGCRP, 2009) reported that a moderate increase in temperature would decrease the yields of rice, maize, wheat, sorghum, bean, cotton and peanuts.

Furthermore, the Indonesia Climate Change Sectoral Roadmap (2009) released by Bappenas (the National Development Planning Agency) reported that climate change will likely decrease rice paddy yield by 20.3 to 27.1%, maize yield by 13.6%, soybean yield by 12.4%, and sugarcane yield by 7.6%. Pollination and grain-set processes begin to fail if crops are frequently exposed to high temperature thresholds. Higher temperatures also increase crop respiration rates and reduce carbon capture.

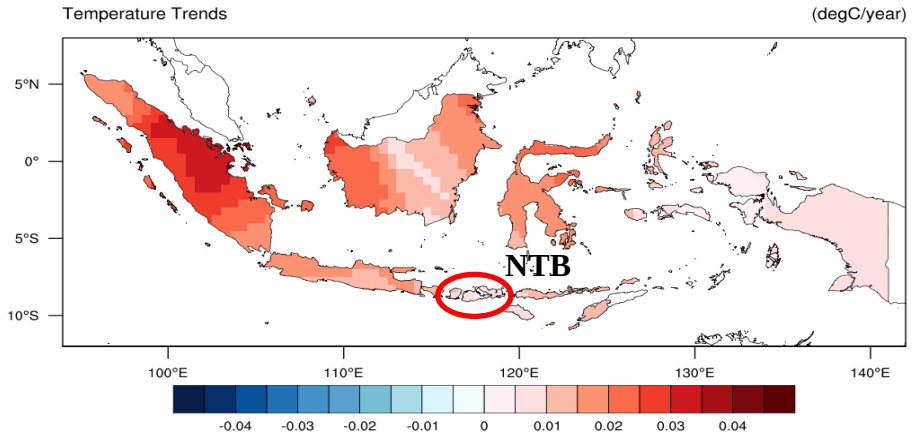


Figure 5. Trend of mean temperature increase in Indonesia during the period of 1965 – 2009 (CRU, 2008)

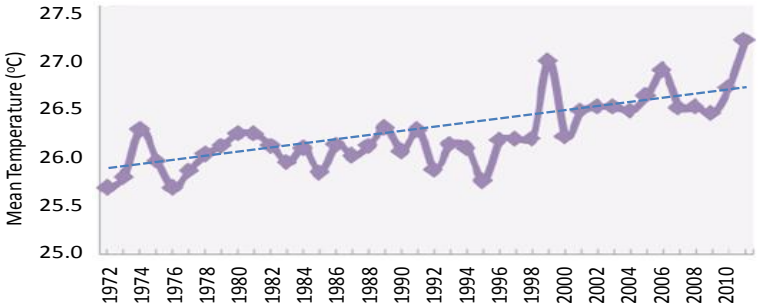


Figure 6. Trend of mean temperature increase during the period of 1972-2010 in NTB (Data from Bureau of Meteorology, Climatology and Geophysics)

Rainfall patterns in NTB have changed. A trend analysis of 355 rainfall stations[1] from all over Indonesia shows that wet season rainfall (December-February) has increased, while rainfall in other seasons, particularly March to May and September to October has decreased in most regions of NTB (Ministry of Environment, 2011). These changes partly explain why NTB is experiencing increasing flood risk, particularly in Bima and Sumbawa (see Figure 3), while simultaneously experiencing increased drought in dry years, particularly in Lombok Tengah (see Figure 4).

A number of studies show that the El-Niño phenomenon has become more intense and its frequency relative to La Niña has increased since the 1970's (Latief and Keenlyside, 2009; Hansen et al., 2006)[2]. Therefore, it is likely that delayed starts to the agricultural season will continue. At the same time, this will increase the potential for greater incidence and intensity of cyclones (high rainfall and strong winds).

Based on an analysis of 28 General Circulation Models (GCMs) under different scenarios of Representative Concentration Pathways (RCP) from the CMIP5 database, rainfall in NTB is projected to increase in the rainy season (December to February) and decrease in the dry season (June to August) by 2025 and 2050. As a result, water supply for agriculture in Lombok Island is projected to decrease by about 28%, according to a study conducted by Ministry of Environment, GIZ, WWF and Provincial Government of West Nusa Tenggara (2010a)[3]. The change will be exacerbated by poor irrigation facilities.

NTB is also vulnerable to sea level rise, as the province consists of several small islands. A rise in sea level will reduce available arable land, increasing flood risks and increase salinization/salt intrusion (Nicholls and Mimura, 1998). The Ministry of Environment and GIZ study projected that sea levels on the Northern coast of Lombok, the biggest island in NTB, could increase by about 35 to 40 cm by

[1] The length of these records is between 20 and 50 years, with most of the records started after the 1950s.
[2] Latif M, Keenlyside NS (2009) El Niño/Southern Oscillation response to global warming PNAS December 8, 2009 vol. 106 no. 49 20578-20583
[3] Ministry of Environment, GIZ, WWF, and Provincial Government of NTB, 2011. Study on risk and adaptation to climate change in Lombok Island, West Nusa Tenggara Province: Water Resources. Project Report, Ministry of Environment, Republic of Indonesia, Jakarta

2100 relative to the 2000 baseline[4]. As rice, the staple crop in the province, ranks among the most sensitive crops to salinity, especially in its reproductive phase, these changes will have a direct impact on agricultural production and livelihoods in the province (Maas and Grattan 1999).

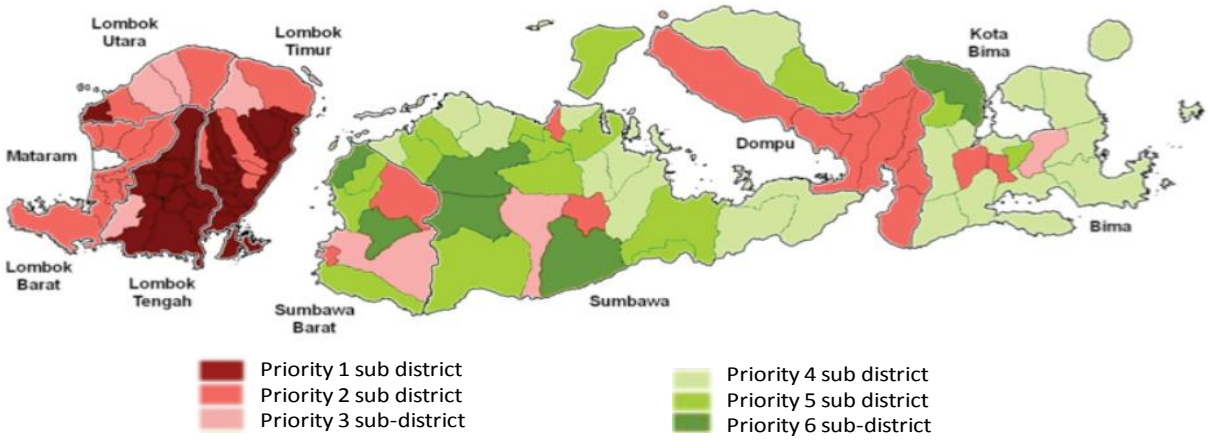


Figure 7. Food Security Vulnerability of sub-districts in 2010. Sub-districts with priority 1 are the most vulnerable (WFP and NTB Provincial Government, 2010) [5]

As a result of the impacts of climate change on agriculture, livelihoods and food security will also be impacted. This poses an urgent problem because food insecurity is already a significant challenge for the province. At present, 64 out of 105 sub-districts in NTB are considered vulnerable to food insecurity. Twenty six sub-districts are classified as Priority 1 level (the most vulnerable) with 14 of these in Lombok Timur and 11 of these in Lombok Tengah (Figure 7).

The main determinants vulnerability to food insecurity in these areas are high rates of poverty, high rates of malnutrition among children under-five, especially stunting, low life expectancy, high female illiteracy and limited access to clean water, electricity and roads.

Without efforts to increase the adaptive capacity of food insecure communities in NTB to climate variability and climate change, these communities will have little ability to cope with more frequent crop failures and production losses. Repeated crop failure would not only decrease farmer income, but also reduce food supply in the area resulting in possible food scarcity and increasing food prices. In response to decreased income and food prices increase, evidence from many countries shows that food insecure populations tend to cope by reducing dietary diversity, often with very negative health and nutrition implications for vulnerable groups such as pregnant and lactating women and young children.

Within NTB, Lombok Island is considered the most vulnerable area (Figure 7). Lombok Island is divided into four main watershed areas. A survey from 2006 by the Central Bureau of Statistics

[4] Ministry of Environment, GIZ, WWF, and Provincial Government of NTB, 2011. Study on risk and adaptation to climate change in Lombok Island, West Nusa Tenggara Province: Sea Level Rise projection and Extreme Climate. Project Report, Ministry of Environment, Republic of Indonesia, Jakarta

[5] WFP, Food Security Agency and NTB Provincial Government, 2010. Food Security and Vulnerability Atlas of West Nusa Tenggara. World Food Programme, Jakarta.

reported that a high number of poor households in Lombok Island are within the Dodokan watershed area, the largest watershed in Lombok Island (Figure 8). Poor households in this area are estimated to account for 50% to 69% of the population (Central Bureau of Statistics, 2006). There are three other watersheds in Lombok Island namely Jelateng, Menanga, and Putih (Figure 8). Despite its important role as the largest watershed supporting agriculture and human needs in Lombok Island, Dodokan is highly vulnerable to flood, drought and food insecurity in both current and future climate condition.

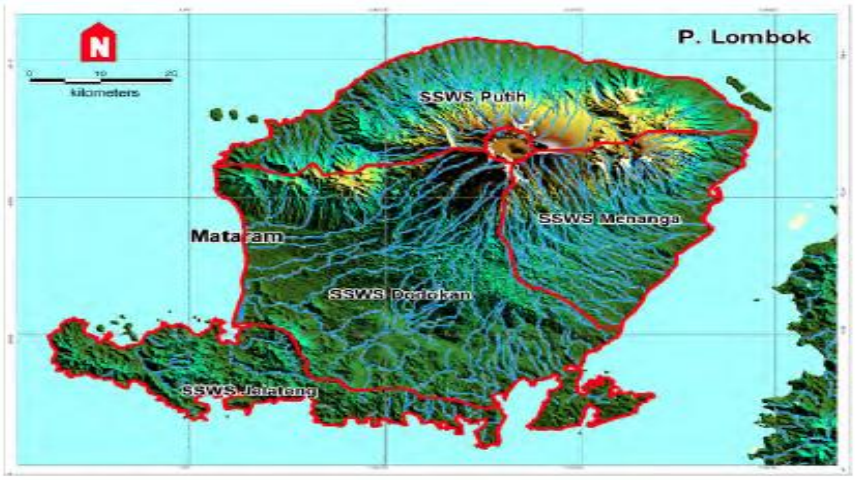


Figure 8. Lombok Island consists of 4 main watersheds: Dodokan, Jelateng, Menanga and Putih

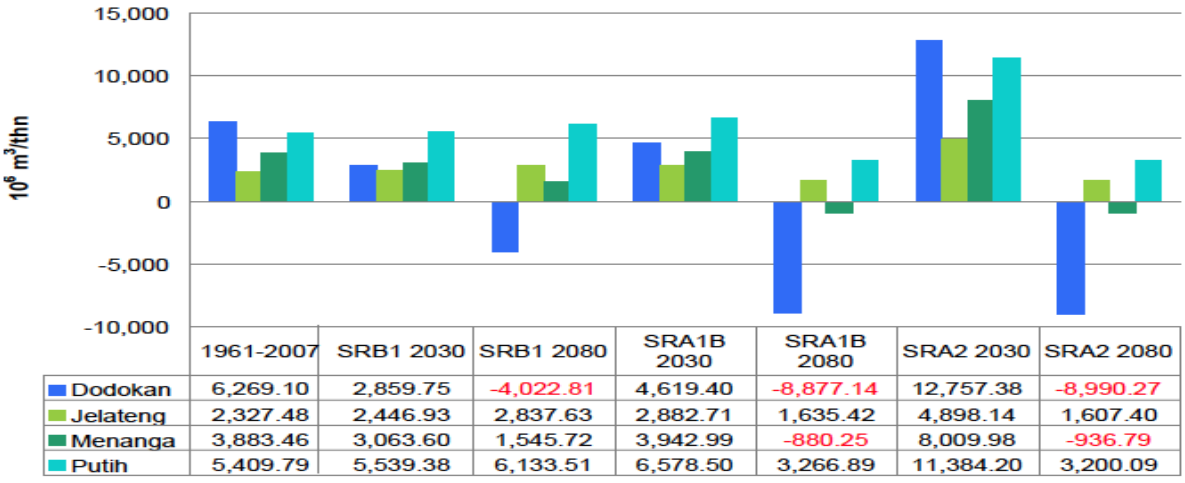
Due to the increasing population, high poverty rates and the lack of alternative livelihoods, the Dodokan watershed is also exposed to deforestation, mostly in the upper watershed area. In the period between 1995 and 2010, about 17% of forest in Dodokan was converted to plantation agriculture (Suhartanto *et al.*, 2012[6]), resulting in increased soil erosion and sedimentation. The highest rate of deforestation has occurred during the reform era of 1998 to 1999, when economic crises hit Indonesia, causing political instability and resulting in illegal exploitation of natural resources.

After 2000, the rate of deforestation decreased, as political and economic stability returned. However, the damage has not been reversed. It is estimated that in 2009 about 38% of areas in this watershed were in critical to very critical condition[7]. As a result the national government has target the Dodokan watershed as a priority for rehabilitation in NTB under the National Midterm Development Plan (2010-2014).

In Lombok Island, at least 20 rivers flood during the wet season. Five are categorized as prone to heavy flooding and another five are categorized as prone to flash flooding (Watershed Management Agency, 2010). During the dry season, however, there is water scarcity with an increasing number of

[6] Suhartanto, E., D. Priyantoro and Itratip. 2012. Studi penilaian kondisi das dan implikasinya terhadap fluktuasi debit sungai: studi kasus pada sub das jangkok pulau Lombok. Jurnal Teknik Pengairan, *3: 1-5*
[7] http://www.dephut.go.id/index.php?q=id/node/4499

waterless rivers, canals and ponds. According to the Ministry of Environment and GIZ[8], under three different climate change scenarios (SRES B1, A1B and A2), assuming no change in land use from current conditions, these watersheds, and Dodokan in particular, will face a serious water deficits. The water deficit in Dodokan is projected to be more than 8,000.10^6 m^3/ year by 2080 (Figure 9). Figure 10 depicts the projection of declining water supply in the Dodokan watershed, largely due to climate change.



	1961-2007	SRB1 2030	SRB1 2080	SRA1B 2030	SRA1B 2080	SRA2 2030	SRA2 2080
Dodokan	6,269.10	2,859.75	-4,022.81	4,619.40	-8,877.14	12,757.38	-8,990.27
Jelateng	2,327.48	2,446.93	2,837.63	2,882.71	1,635.42	4,898.14	1,607.40
Menanga	3,883.46	3,063.60	1,545.72	3,942.99	-880.25	8,009.98	-936.79
Putih	5,409.79	5,539.38	6,133.51	6,578.50	3,266.89	11,384.20	3,200.09

Figure 9. Current water balance of the watersheds in Lombok Island and its projection in 2030 and 2080 based on climate change scenario IPCC SRES B1, A1B and A2 (Ministry of Environment, GIZ, WWF, and Provincial Government of NTB, 2010a).

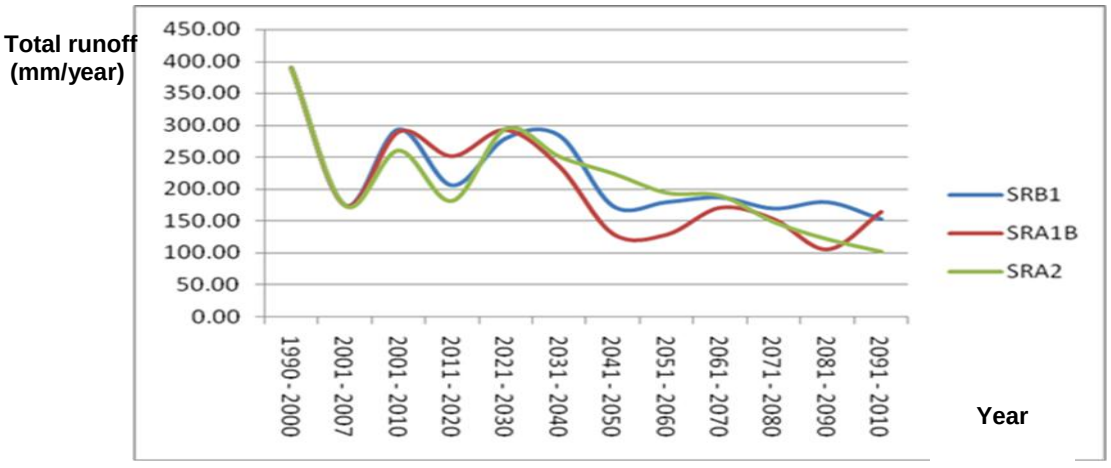


Figure 10. Projection of a declining water supply in Dodokan under 3 climate scenarios (Ministry of Environment, GIZ, WWF, and Provincial Government of NTB, 2010a)

A study conducted by WFP-AusAID-CSIRO Alliance, University of Mataram, and Government of NTB Province (2011) projects that climate change will increase the vulnerability of communities in NTB, particularly on Lombok Island, most especially in the Dodokan watershed area of Central Lombok

[8] Ministry of Environment, GIZ, WWF, and Provincial Government of NTB, 2011. Study on risk and adaptation to climate change in Lombok Island, West Nusa Tenggara Province: Water Resources. Project Report, Ministry of Environment, Republic of Indonesia, Jakarta

District. This study identifies those people whose livelihoods rely on agriculture and fishing as the most vulnerable in the areas (Figure 11).

A Ministry of Environment and GIZ study also found that agriculture in the Dodokan watershed is likely to be exposed to more severe and frequent floods, drought and strong winds. According to this study, the risks of harvest failure due to the extreme climate events are particularly high in the downstream areas of the Dodokan watershed (Figure 12).

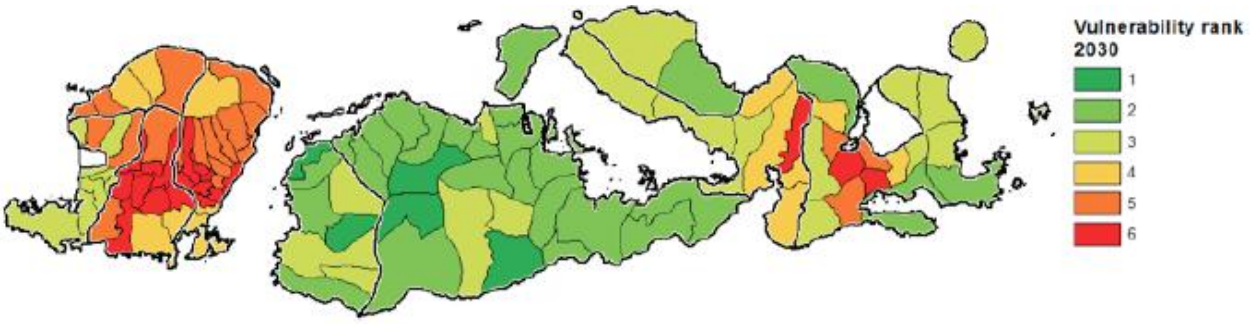


Figure 11. Projection of NTB climate change impact to food security at sub-district level in 2030. Level 6 is the most vulnerable. Source: WFP, AUSAID, CSIRO Alliance, University of Mataram and NTB Provincial Government (2011)

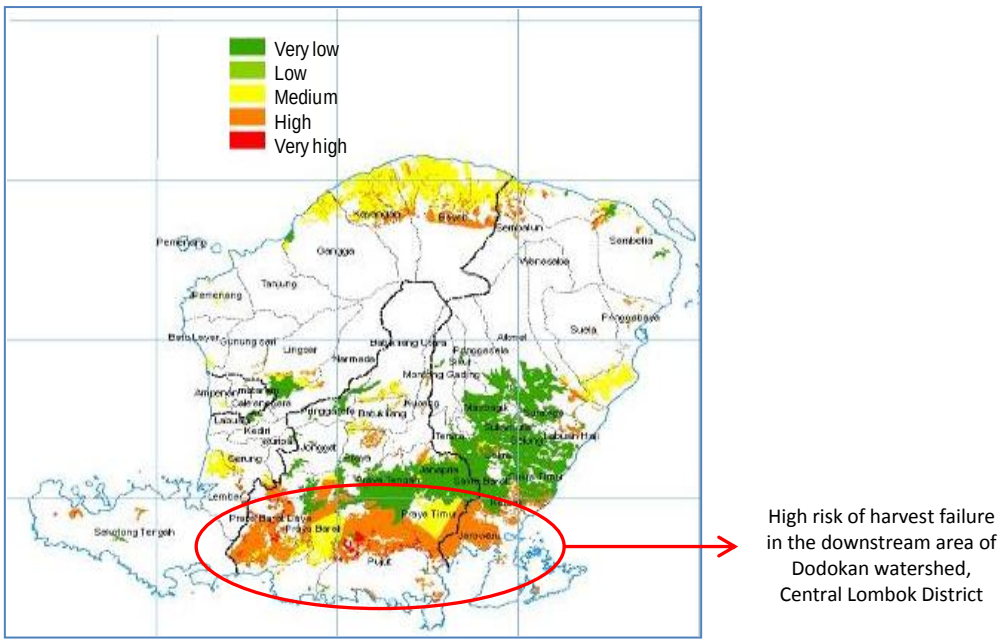


Figure 12. Level of Risk of harvest failure due to extreme climate events in Lombok Island, NTB (Ministry of Environment, GIZ, WWF, and Provincial Government of NTB, 2010c)

A WFP and Government of Indonesia Food Security Analysis shows that poverty and food insecurity is highest among rainfall dependent farmers who have no access to irrigation. In the Dodokan watershed, many upland farming areas do not have access to irrigation. These upland areas are highly exposed to natural hazards such as drought, floods and landslides. Farmers in rain-fed agricultural systems in Dodokan are poorer than farmers with access to irrigation. These farmers have low productivity and produce crops that do not have high market value. Livelihood insecurity is high during the lean season from June to August and from November to February. During these periods, poor farmers become laborers and often migrate out of their villages in search of employment. In these areas, climate change is amplifying the impact of climate variability and climate shocks on already vulnerable populations.

Efforts to increase the capacity of communities to use climate forecasts have been implemented in a number of villages through the Climate Field School program (CFS). The program is coordinated by the Agriculture Office of NTB Province and supported by funding from the Directorate of Plant Protection (Ditlin) of the Ministry of Agriculture. However, the effectiveness of the program in increasing farmers' capacity in managing climate risk has been low. The understanding of CFS facilitators on how to apply climate information is limited and CFS modules that are suitable for the local condition have not been developed. Forecast information is not effectively disseminated and often does not correspond in terms of timing and content with what is most needed by communities on the ground. Communities depend entirely on local knowledge in predicting the weather and climate.

Due to the lack of resources, the capacity of the government to rehabilitate infrastructure damaged by climate hazards, particularly floods, is also very low. The resources normally provided to rehabilitate infrastructure such as irrigation facilities damaged by a flood is far from enough. As a result, a lot of the infrastructure in NTB has been progressively degrading because of increasingly frequent floods. According to the Public Work Offices of NTB (2012), about 60% of the irrigation facilities are damaged and need rehabilitation.

The Provincial Government is already aware of this issue and has established a Task Force including various agencies to address climate change and food security issues. The Climate Change-Food Security Task Force has produced a Strategy and Action Plans for 2011-2015. At the district level, task forces on climate change have yet to be established, but, district level food security taskforces do exist. These district food security task forces have partially addressed the issue of climate change adaptation in its action plans; although the capacity of district governments to translate the provincial strategy into local programs and actions has not been adequately developed.

A vicious cycle results where a deteriorated environment triggers negative coping behaviours by increasingly vulnerable and food insecure populations which in turn puts further strains on that same environment. Carefully designed and implemented adaptation interventions can break that vicious cycle and transform it into a virtuous one, where climate change adaptation protects and strengthens livelihoods, thereby increasing rural incomes and enabling rural populations to adopt more sustainable lifestyles. As the most degraded area likely to suffer most from climate change, Dodokan watershed in central Lombok District has been selected as the main focus area for the proposed adaptation interventions.

PROJECT/PROGRAMME OBJECTIVES AND TARGET LOCATIONS:

The overall objective of the project is to secure community livelihoods and food security against climate change-induced rainfall variability leading to more intense and frequent climate events while simultaneously supporting the Government's renewed, deliberate efforts to address the underlying anthropogenic drivers that have caused the degradation of land and increased the vulnerability of communities to food insecurity and climate change.

The project targets the area's most vulnerable to food insecurity and the impact of climate change. The target district has been prioritized by the national and provincial governments. This district, Central Lombok District of Lombok Island's Dodokan watershed encompasses the largest watershed in the province and also the one most vulnerable to increasingly severe and erratic weather. The project will target up to 18,000 households or 15% of the total households living in Dodokan watershed and hundreds of local stakeholders and decision makers. The interventions selected for the project have been selected on the basis of extensive field consultations held in 2013 in ten locations of the Dodokan watershed.

The project will improve institutional capacity at village, district and province level to develop climate-sensitive integrated watershed management plans, involving all concerned stakeholders and placing the community at the centre of the process. It will also deliver a menu of 'no-regrets' adaptation actions which will help build more climate resilient livelihoods for rainfall-dependent farming households and develop alternative livelihoods in the upstream and downstream areas identified through field surveys and secondary data analysis.

The project is planned to last four years. While it will not be able to reverse the impact of climate change during that time frame, it will give local government, civil society and communities the tools and knowledge to accomplish this ambitious aim over a longer time frame. Within the project time frame of four years, it will deliver tangible outcomes on the ground that include increased local availability of food, better access to it for the poor, strategies to overcome lean season food insecurity and income diversification. It will increase and diversify income sources enabling communities to better withstand current and future climate risks. Improved water storage and irrigation will help overcome uncertainty of rainfall, improved soil quality and fertility will increase yields. The project will also demonstrate good practices that can be replicated in governments' larger efforts to tackle the underlying drivers of deforestation and land degradation in the area. Better connectivity to early warning and climate services combined with more efficient agriculture extension service will further increase the resilience of communities. The most important outcome of all that is expected within the four year time frame is empowered stakeholders which will ensure sustainability of the project's activities with a much reduced level of external assistance.

PROJECT / PROGRAM COMPONENTS AND FINANCING:

PROJECT COMPONENTS	EXPECTED CONCRETE OUTPUTS	EXPECTED OUTCOMES	AMOUNT (US$)
1. Improving knowledge and institutional capacity of local governments to reduce climate risks associated with rainfall variability and their impact on community livelihoods and food security	1.1. Extension workers, local government officers at village and district levels are trained and mobilized to • assess climate risk under different land use scenarios • improve management of land and water resources	Increased knowledge and capacity of local communities and governments to manage climate risks and full ownership of adaptation measures in communities in targeted district and watershed	150,000
	1.2. Community members and farmer organizations are trained and mobilized to • design and monitor the implementation of local climate change adaptation plans that address gender specific issues and vulnerable groups • ensure anthropogenic causes of land degradation are addressed by the community to complement community efforts to self-police negative practices resulting in land degradation by improved law enforcement		150,000
	1.3. Local food security and adaptation plans are integrated with district and provincial development plans, and a climate-sensitive integrated Master Plan for watershed management is developed.		150,000
	1.4. An early warning system for climate-related disasters in target sub-districts is designed, implemented and maintained.		350,000
	1.5. Lessons learned from community and local experience are shared and used for refining and prioritizing provincial climate change adaptation actions		200,000

2. Building climate resilient livelihoods of rain-dependent farming households in the upstream and downstream areas of Dodokan watershed in Central Lombok District, covering up to 18,000 vulnerable households	2.1. Crop management is introduced and applied by farmer communities to better adapt to climate-change induced rainfall (and temperature) variability, causing extreme weather events such as droughts and floods..	Diversified and strengthened livelihoods and sources of income enable vulnerable farmers and landless rural families to tackle the climatic and anthropogenic drivers of vulnerability and enhance the community's ability to use climate information for managing climate risks.	800,000
	2.2. Increased income for vulnerable families through the creation and improvement of natural and physical livelihood assets		1,000,000
	2.3. Adaptable animal husbandry practices and home gardens as alternative sources of income for farm families are promoted and implemented		800,000
	2.4. Post-harvest handling, storage, basic processing and quality standards of food- and cash crops and access to markets by/for farmer communities are improved.		600,000
	2.5. Vulnerable families protected from climate risks through micro-insurance.		600,000
Component 1			1,000,000
Component 2			4,000,000
Project/Program Execution cost <9.5%			475,000
Total Project/Program Cost			5,475,000
Project/program Management Fee charged by the Implementing Entity 8.5%			463,375
Amount of Financing Requested			5,940,375

PROJECTED CALENDAR:

MILESTONES	EXPECTED DATES
Start of Project/Program Implementation	December, 2013
Mid-term Review (if planned)	April 2015
Project/Program Closing	November, 2017
Terminal Evaluation	February, 2017

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. *Describe the project / programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.*

Agriculture within the district targeted by the project faces the highest risk of recurrent harvest failure due to climate change in NTB province. Dodokan is the principal source of irrigation water for Central Lombok District. Official data show that the Dodokan water balance deficit during the last 10 years is the highest among all of Lombok's watersheds and that 55% of droughts in the province occur in Dodokan. If current conditions continue and are exacerbated further by climate change, water availability and food security will become insurmountable problems, perhaps forcing migration out of the area. Thus, integrated efforts to restore and sustainably manage the watershed are crucial to supporting adaptation and food security in the area.

Schematically, the problems can be presented in the below problem tree (Figure 13). Two main factors are causing the increased vulnerability of the agricultural system and food security to climate variability and climate change. The first is a combination of inadequate policies and lack of capacity of local government to cope with climate variability and climate change, which results in a limited number of often insufficient or inadequate programs. The second is low capacity of communities to manage climate risk and lack of knowledge which often lead them into unsustainable farming practice and cause further damage to the environment.

The first factor is closely associated with the inability of the policy makers to translate climate change awareness into risk reduction measures in short, medium and long term development plans. This is often due to a limited understanding of climate change, lack of availability of tools needed to assess climate change impact and to inform decision making and limited adaptation technologies and human resources. The second factor is closely associated with the acceleration of environmental degradation due to poverty and weak capacity to effectively use climate information to manage current and future climate risks.

Addressing the first factor requires better climate change policy and programs and an improved capacity of local government to design and implement these, while the second requires strengthening the resilience of vulnerable groups to empower them to cope better with climate variability and change. This can best be achieved through a combination of poverty alleviation measures, improved use of technology, the development of alternative livelihoods, an improved institutional coordination, and the development of an effective climate information system. Outcomes of this project will prepare the stage for sustainable community-driven and -owned interventions. It will generate the institutional mechanisms and create the knowledge, tools and skills to develop and run the system.

In order to address both factors and achieve optimal outcomes, the project activities will be structured under two main components. Outcomes of component 1 will improve the capacity of

local government and communities to manage climate risk and further address land degradation and deforestation in the area. This component will strive to address the policy and programmatic gaps, and to develop and implement integrated watershed management involving all concerned stakeholders with strong community participation and ownership. Outcomes of component 2 will seek to build resilient livelihoods of vulnerable groups in the face of more unpredictable and damaging weather patterns and to develop alternative livelihoods to assist Government's broader efforts to address underlying drivers of land degradation and vulnerability to food insecurity and climate change. Taken together, both create a virtuous cycle where good policy, improved capacity and concrete adaptation actions empower communities to adapt to the effects of climate change and to reverse the environmental damage which if unchecked would further increase their vulnerability.

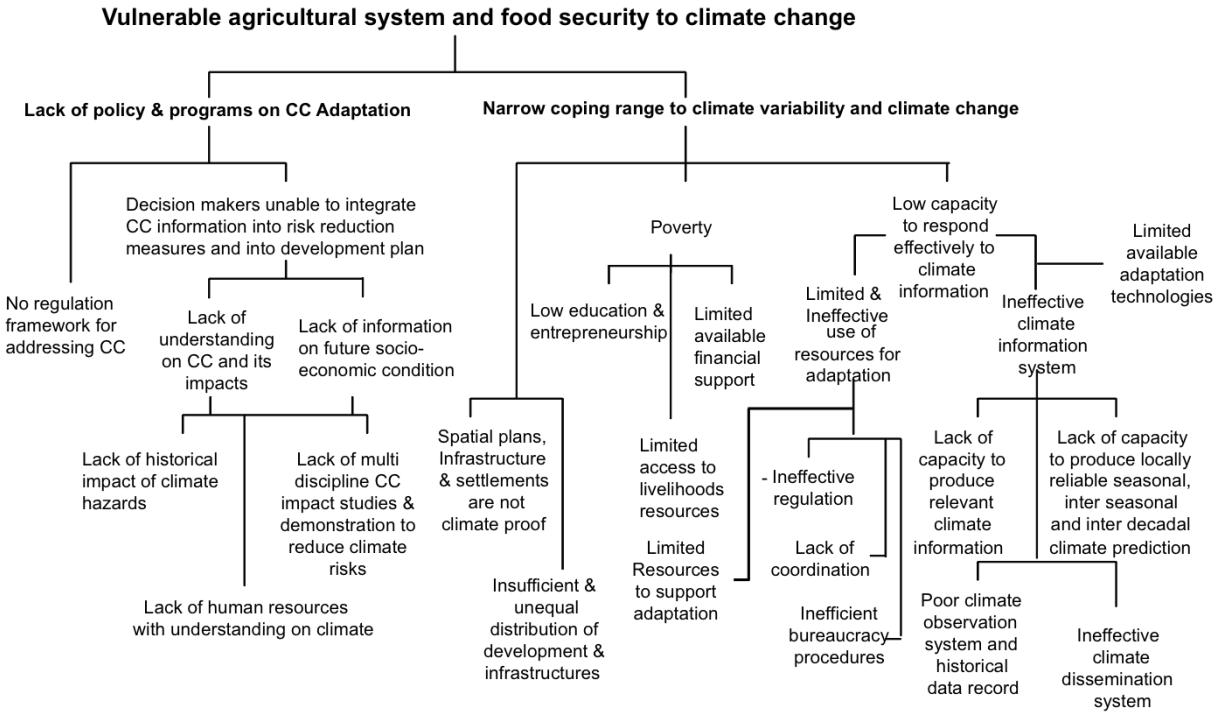


Figure 13. Barriers to Climate Adaptation in NTB (modified from Boer, 2007[9])

The outcomes and outputs are designed to address the following issues:

1. Capacity of the local community to use climate information to manage climate risk;
2. The specific vulnerabilities of rainfall-dependent farmers and other at-risk groups, including strategies to overcome lean season food insecurity for women;
3. Income diversification especially for women;
4. Improvement of agriculture infrastructure to enable more climate-resilient food production systems;
5. Advocacy for behavioral change from unsustainable to sustainable land use practices;

[9] Boer, Rizaldi. 2007. National Programmes on Climate Change Adaptation. UNDP Project Report.

6. Community forest protection through the establishment of village conservation agreements;
7. Protection from climate risks through micro-insurance for vulnerable farming families.
8. Improvement of the quality of agricultural extension services, especially by raising awareness on climate change and strengthening technical capacity to assist with the design and implementation of adaptation measures;
9. Improvement of water and land use management in the watershed to overcome uncertainty and severity of drought and floods; and
10. Balance of self-policing and improved law enforcement to address the anthropogenic drivers of land degradation and deforestation.

Component 1: Improving knowledge and institutional capacity of local governments and community to reduce climate risks associated with rainfall variability and their impact on community livelihoods and food security.

Increasing numbers of people and livestock, particularly in steep, mountainous watersheds, along with unsustainable farming practices, are causing forest and land degradation. The cost of such degradation is manifested in eroded soil, reduced productivity, landslides, diminished water quality and quantity and loss of biodiversity. Provincial and district governments are putting in place programs to address the situation, however, their success may be compromised by poor capacity, insufficient funding as well as the more severe and erratic weather brought on by a changing climate. Local governments are promoting more sustainable farming practices, but these will not be sufficient. Measures are needed to ensure that climate change is considered in local, district, provincial and national planning.

Outputs and activities established in component 1 aim to improve the capacity of local governments and related stakeholders to design adaptation plans and set the conditions that would allow improvement in land and water resources management, reduction of post-harvest losses, and reduction of food insecurity and climate vulnerability through improvement of natural and physical livelihood assets and the introduction of risk transfer mechanisms; such as micro-insurance. Capacity development in climate risk analysis and development of land use scenarios under different climate scenarios will help to identify climate vulnerabilities and adaptation actions according to the needs of targeted communities. Further information on the linkages between component 1 and 2 can be found in figure 14.

Activities and outputs in component 1 include supporting the government in identifying potential sources of funding and leveraging international cooperation on climate change adaptation; helping to overcome due limitation of funding at local level.

Five outputs are proposed:

Output 1.1: Extension workers, local government officers at village and district levels are trained and mobilized to (i) assess climate risk under different land use scenarios; and (ii) improve management of land and water resources.

An improved understanding of the current land use dynamics and possible changes to it due to climate change and other factors as well as the implications of the changes for the capacity of the watershed to provide ecosystem services is crucial for developing a land use plan that increases watershed resilience. Activities established in output 1.1 will contribute to identify climate vulnerabilities and adaptation actions to design a local adaptation plan to enhance climate adaptation capabilities of food insecure population.

Landscape-based activities in the watershed will be defined through a participatory process that takes into account the ecological zone and community priorities. The strategy is grounded in Indonesian experience demonstrating that community-level adaptation requires awareness raising, increased knowledge, improved capacities and the stable provision of ecosystem services. By maintaining large-scale resilience, the flow of ecosystem services will be maintained, without irreversible ecosystem regime shifts.

This output will also contribute to the initiative at national level. The Ministry of Environment is developing an Online Vulnerability Assessment (VA) that aims to monitor and evaluate the attainment of National Action Plan on Adaptation (RAN-API). If the capacity of local government has been improved, they can also contribute to the development and refinement of such an online VA. For example, local government can contribute to the identification of relevant indicators at local level for the vulnerability assessment.

Specific activities under Output 1.1 include:

1. Support the provincial government in identifying gaps in available studies on land use dynamics in the watershed system of Dodokan; as well as the development of land use scenarios, under different climate scenarios, in close consultation with relevant stakeholders and communities.
2. Support the assessment of current and future climate risks in Dodokan watershed under different land use scenarios and identify relevant options for improving land and water management, crop management and assets creation that reduce food insecurity and enhance climate adaptation capabilities of households living in the watershed.
3. Jointly conduct a feasibility assessment for the development of a micro-level climate risk insurance scheme in the region, with local government and private sector counterparts.
4. Enabling the Task Force to make the necessary budget allocations for prioritized adaptation plans and to identify resource gaps;

Output 1.2: Community members and farmer organizations are trained and mobilized to (i) design and monitor the implementation of local climate change adaptation plans (that also address gender specific issues and vulnerable groups); and to (ii) ensure anthropogenic causes of land degradation are addressed through community efforts to self-police negative practices resulting in land degradation, backed up by improved law enforcement.

This output will provide the necessary foundation to deliver most of the project results under Component 2. Farmer Organization strengthening is the key to effective project delivery on the ground. Importantly, every farmer group in the target areas will develop a management plan for

small-scale, 'no-regret' adaptation plans. These plans will be guided by the village level implementation committee set up through the project and technically assisted by the district government officials and implemented with community and local government support. Multiple funding sources for the upkeep and maintenance of the adaptation action plans would include membership contributions, development programs implemented by national and provincial governments and technical agency budgets.

Farmer groups will receive training in climate risk identification and adaptation planning, including the methodology of conducting Vulnerability Assessments (VA) so that they can conduct community-level VA in each target village at the beginning and end of the project cycle. VAs in this project serve as a vehicle to increase household level awareness as well as a tool to plan adaptation actions and measure their effectiveness. Training will include gender sensitivity and food security analysis.

Specific activities under Output 1.2 include:

1. Development of a training module to help communities and farmer organizations to assess climate and non-climate risks; community level vulnerability assessment and adaptation planning and implementation of the training plan. Training local government officers and key stakeholders to conceptualize and design efficient adaptation projects;
2. Identification and design of local climate change adaptation plans and monitoring system;
3. Advocacy for the community to design village conservation agreements (forest protection), using customary law and local wisdom (*awig-awig*),
4. Supporting the establishment of a participatory reporting and monitoring mechanism (related to output 1.2.) for land use change to avoid further illegal logging activities and to strengthen law enforcement;

Output 1.3: Local food security and adaptation plans are integrated with district and provincial development plans, and a climate-sensitive integrated Master Plan for watershed management is developed.

An integrated land and water management plan from the upstream to the downstream of the watershed is necessary to ensure that the development of watershed follows the landscape rather than community preferences.

Based on the activities of Output 1.1, the master plan of landscape-based, integrated watershed management will need to be integrated into local development plans in order to strengthen the resilience to climate change-induced food insecurity. Besides, the project also contemplates the inclusion of indigenous knowledge for capturing local conditions; which will be collected through field observations, focus group discussions and interviews.

Specific activities under Output 1.3 include:

1. Conducting discussions with related stakeholders and local authorities in Dodokan watershed to design the master plan

2. Training for the provincial Climate Change Task force in planning and prioritizing adaptation programs under the Master Plan; including budget allocation and identification of additional investment required;
3. Facilitating the Task Force to support local governments in adopting and integrating the Master Plan;
4. Supporting local governments to integrate the Master Plan into their planning processes
5. Supporting the process of integration of gender and food security dimension into the existing land and water management in Dodokan watershed system, the master plan; and into district and provincial plans to ensure prioritization of funding;

Output 1.4: An early warning system for climate-induced disasters in targeted sub-districts is designed, implemented and maintained.

An effective early warning system for coping with extreme climate events and managing future climate risks is needed to support the activities under the Outputs 1.1 – 1.3 and all activities under Component 2. There is also a need to strengthen the institutional mechanism to disseminate and translate climate information into local strategies.

At national level BMKG has been providing regular climate forecasts and the Ministry of Agriculture has developed a dynamic cropping calendar and assigned BP2TP (Agricultural Research Agency) at local level to disseminate and utilize the cropping calendar. However, the dissemination system remains weak. Information from BMKG is still rarely applied to field activities. During the consultation process, it became apparent that the weaknesses were mostly caused by a confusing system of coordination and dissemination between the Meteorological Agency, Agriculture Agency, and the communities who are the users of information. Also, there were difficulties in translating climate forecast data into languages local farmers understand because of the limited capacity of agriculture extension workers. Finally, there was little understanding of indigenous wisdom, knowledge and practices.

It is therefore necessary to improve the accessibility and application of national data locally and to also identify and leverage local wisdom for managing climate risks. The project will begin with field observations, focus group discussions and interviews. Individuals who show appreciable knowledge of climate change and adaptation will be selected for in-depth interviews in order for project staff to carry out a comprehensive analysis of the effectiveness and challenges of traditional coping strategies. These individuals will also be supported as champions for dissemination of information.

Overall, the improvement of capacity at local level to understand and use climate information aims to support national efforts to enhance the flow of information down to, and back up from, communities. Currently, the Ministry of Environment is developing an online system for monitoring vulnerability to and risks of climate change with the aim to leverage locally collected information for its analysis.

Specific activities under this Output 1.4 include:

1. Evaluation of existing early warning information for NTB province and development of an effective information and dissemination system;
2. Facilitating the discussion with relevant stakeholders on the use of climate early warning systems and how to strengthen existing institutions' ability to utilize information at all levels;
3. Helping local government develop an institutional mechanism to utilize climate information for early warning systems. This mechanism is also expected to support local plans to develop climate resilient watershed management systems and agricultural practices;
4. Supporting the establishment of a technical team, consisting of farmer groups and extension workers, that will be responsible for translating and disseminating climate information into technical or operational actions;
5. Supporting the technical team to develop a site-specific Climate Field School (CFS) module.
6. Inclusion of climate change indicators into the provincial Food Security Monitoring Program in order to forecast climate-related production shortfalls and price shocks;

Output 1.5: Lessons learned from community and local experience are shared and used for refining and prioritizing provincial climate change adaptation actions.

This project is expected to generate a number of lessons learned which can be replicated in other areas or at national level. It will provide Bappenas with a platform to field test its own strategies and actions for the National Action Plan on Climate Change Adaptation (RAN-API) and the NTB Government for the Action Plan on Food Security under Changing Climate. This output would therefore serve as a necessary feedback mechanism through which successful practices and strategies are endorsed and scaled up in future action plans.

Media attention on project impacts and results is an essential means of broadcasting replicable models to other regions, provinces and districts with similar issues. A good media strategy will not only inform the general public, but also provide a channel to other government agencies. This output will support organized visits to the project areas for National Project Steering Committee (NPSC) members and invited officials of Bappenas, Ministry of Environment, etc. Targeted exchange visits from communities within the targeted areas and elsewhere in the watershed will support immediate replication of the model or some of its more successful elements in other vulnerable areas.

Specific activities under Output 1.5 include:

1. Documentation of process and outcomes from local experiences including the identification of lesson learned relevant to national context;
2. A media campaign targeting both print and electronic media in national and local media (using local languages);
3. Workshops with key stakeholders on climate change adaptation at national and provincial level;
4. Exchange visits from adjacent communities to promote replication potential and bring the adaptation focus into local development planning processes, especially village development plans;

Component 2: Building climate resilient livelihoods of rain-dependent farming households in the upstream and downstream areas of Dodokan watershed in Central Lombok District, covering up to 18,000 vulnerable households.

Outputs and Outcomes in Component 2 are fully aligned with the National Action Plan on Climate Change under the coordination of Bappenas. They specifically support the Provincial Strategy and Action Plan for Food Security under Changing Climate of NTB.

The project would allow Bappenas and NTB Provincial Government to test the corresponding menu of actions and indicators that are included both in the National and Provincial Action Plan. These actions include selecting and cultivating high yielding and drought tolerant rice varieties, adopting suitable land and crop management practices, adjusting rain-fed farming practices to rainfall variability, adopting a surveillance and forecasting system to measure impacts of climate change and adjusting home gardening practices to a seasonal cropping calendar in order to reduce demand for irrigation water.

This component directly addresses rainfall variability, the key climate change problem identified in the watershed, while at the same time also addressing the non-climatic anthropogenic drivers which cause land degradation through the empowerment of community forest protection and village conservation agreements.

The component is designed to reach up to 18,000 vulnerable farm families, to implement concrete, 'no-regret' adaptation actions within the targeted upstream and downstream areas of Dodokan watershed in Central Lombok District. All of the activities depend on active participation of the community members and will use their work force, especially during the lean season, so as to not interfere with the regular farming activities. While community members will benefit from the improved infrastructure and environment in the medium and long term, they will be compensated for their services along the lines of the Food-for-Assets model previously implemented in NTB and elsewhere with great success. However, as explained elsewhere in this concept note and given the good availability of food and functioning markets, preference will be given to a cash or voucher transfer.

While there are also activities related to capacity development under this component to ensure knowledge transfer and sustainability of the assets created, most of the budget share will be prioritized and allocated (95% of total budget of Component 2) for creating concrete and tangible adaptation investment on the ground itself.

The component will have 5 key outputs as below:

Output 2.1: Crop management is introduced and applied by farmer communities to better adapt to climate-change induced rainfall (and temperature) variability, causing extreme weather events such as droughts and floods.

Activities will support farmer communities that are vulnerable to food insecurity to adapt their agricultural activities to climate-change induced rainfall (and temperature) variability. Implementation will be undertaken jointly by farmer communities, Sub-district-, District- and Provincial level government institutions and possibly NGO's and private sector to build trust and understanding and stimulate the exchange and blending of traditional and modern knowledge and practices.

Indicative activities include:

Field/community adaptation activities:

1. Conducting field trials for drought resistant food and cash crops, bio-fortified crops as well as finding ways to increase the cultivation of nutritious foods which can improve local diets (including perennials and fruits);
2. Joint establishment with farmer communities of trial plots and seed banks for the selection and storage of different (local) high yielding food- and cash crop varieties that can tolerate rainfall (and temperature) variability. For lowland/downstream areas the focus will be on drought tolerant crop varieties. For mountainous/upstream areas the focus will be on crop varieties that can tolerate heavy rainfall and strong winds. Maintaining a diversity of high yielding tolerant crop varieties will reduce the risk of crop failure. With regard to the food crop varieties, focus will be on both staple food crops as well as nutritious, additional food crops to stimulate dietary diversity.
3. Adoption of soil conservation techniques for enhanced resilience to droughts and floods by farmer communities, including techniques to increase the water holding capacity of drought prone soils, to increase soil nutrient status, e.g. organic (and chemical) fertilizer usage and to reduce the risk of erosion in flood prone areas, e.g. establishment of agroforestry systems in upstream areas.
4. Maintenance of existing and construction of new community water reservoirs and related essential infrastructure (e.g. canals, pipes, pumps and energy supply) by farmer communities for enhanced water security in areas with high vulnerability to water insecurity.
5. Improving access to and application of seasonal and short term weather forecasting information by farmer groups and community leaders to better decide on cropping calendars and water use in cooperation with BMKG and the Agriculture Office.

Capacity development activities:

6. Dissemination of scientific climate and weather forecast information to farmer communities and extension workers and establishment of an iterative process integrating scientific and indigenous weather forecast information.
7. Training for farmers to improve capacity on agricultural production techniques, including factors determining productivity, quality and shelf-life of crops and establishment of 'water user groups' that will develop and implement management plans for the water resources that the communities rely on.

Output 2.2: Increased income for vulnerable family through the creation and improvement of natural and physical livelihood assets.

Through cash/ voucher for work scheme, farmers will have opportunities to produce small scale agricultural and rural infrastructure assets that benefit their communities and halt or reverse land degradation. The assets will be designed to strengthen resilience to withstand climatic shocks and sustain livelihoods and food security. The distribution of food and cash for work will be carried out during the lean season when most rain dependent farmers lack employment and income.

There is a lot of abandoned or unproductive land in the upstream and downstream area of Dodokan watershed. A lot of land is degraded as communities have resorted to negative coping behaviors such as illegal logging and unsustainable farming practices. Limited knowledge and capacity of the community to cultivate the land becomes the main barrier. Therefore, the design of activities under Output 2.2 will consider the specific characteristics of the watershed landscape, socio-economic conditions and sustainability in the face of more erratic and severe weather. The activities will be specifically designed to provide people with assets which allow them to sustain their livelihoods, thereby reducing the need for further deforestation. Creating economic value will be combined with raising awareness about the importance of restoring degraded land and conserving it to ensure the sustainability of the assets itself. Payment for Environmental Services (PES) schemes will be explored to create a win-win situation where the community in the upper watershed provides the environmental services and the community in the lower watershed receives the ecological and economic benefits from it. The project will work with both communities toward quantifying the value of the services provided in the upper watershed so as to enable such schemes. While such schemes often make sense, they tend not to be implemented because local government may not fully see their benefits or lack the capacity to put in place adequate coordination and communication between the affected communities. Lesson learns from the previous WFP experiences in developing PES mechanism between communities in the upper and lower watershed will also be used to improve the mechanism and further scaling up into wider water catchment area of Dodokan in Central Lombok.

The activities under this output will be complemented by strengthening the communities' ability to self-police practices leading to anthropogenic land degradation under output 1.2. as well as by training local law enforcement to complement the community's efforts in this regard through improved and more consistent law enforcement.

Identification of relevant assets will be based on farmer choices through consultations and the activities identified in the Master Plan (Outputs 1.1-1.3.). An indicative set of activities might include the following:

<u>Field/community adaptation activities:</u>

1. Constructions of hill-top ponds, community ponds, irrigation canals, check dams, terracing, feeder roads and water harvest and storage systems;
2. Introduction of sustainable land and soil management techniques to control erosion and slope stabilization (hedgerows, contour drains, bunds) at household and settlement levels;

3. Community-based agroforestry/ reforestation activities involving tree planting and maintenance of these plants to protect catchments for drinking and irrigation water in upper catchment areas and forest buffer zones to reduce forest encroachment;

Capacity development activities:

4. Advocacy and training for behavioral change and PES scheme;
5. Support the establishment and enforcement of village conservation agreements, which also function as community-driven forest protection;

Output 2.3: Adaptable animal husbandry practices and home gardens as alternative sources of income for farm families are promoted and implemented.

This output aims to enhance the resilience of community livestock and fishery income to climatic shocks, to increase income from food production and to enhance animal protein consumption in the community, especially for children. Given the high stunting levels, increasing access to animal source foods is critical.

Traditionally, livestock in Central Lombok is still very much dependent on the unmanaged resources which area available in the area. This unmanaged practice will become increasingly unsustainable due to climate shocks and may also create disturbance to forests as cattle may enter the forest area to find food. The output will introduce an innovative technique that uses agricultural waste as a main constituent, upon supplementation with low-cost additives (molasses and bran) for improvement of its nutritional value in animal fodder. This will reduce the disposal (by burning) of the agricultural waste and thus will help to mitigate GHG. The use of biogas from the cattle dung for cooking will be an additional benefit from more sustainable animal husbandry practices. A dissemination and breeding plan will be developed in cooperation with local partner NGOs, whereby they will disseminate the female cattle to farmers on a revolving basis.

Home gardens can supply a household of six people with fresh vegetables for a year. By replanting and ensuring that the ground is fertilized well, the home garden can be farmed fruitfully for years. Particularly for women, the opportunity afforded by owning a home garden or a plot in a community garden can be significant. As the primary producer in agriculture at large, a woman's ability to take some ownership and control over food production means that she cannot only provide food for her family, but also sell her produce as a source of income. With programs like Cash/ Voucher for Assets, women can also increase their knowledge of crop production and utilize these skills to compete in the labor market. Ultimately, home gardening can empower women to secure a reliable food source for their families and break the cycle of poverty by entering into the larger agriculture marketplace.

Home gardens can also play a vital role in combating the effects of climate change. As increasingly unpredictable weather patterns make drought and other agriculturally disastrous events more frequent, the availability and affordability of food coming from traditional sources such as industrial farms is threatened. Sustainable alternatives to industrial agriculture, such as community gardens, diversify the food production system and can serve as a safety net in times of crisis. The activities under this output will promote economic diversification, helping rural communities to become less dependent on climate sensitive livelihoods and forest exploitation.

Indicative activities include:

Field/community adaptation activities:

1. Introducing stall feeding and corralling to prevent free-grazing livestock from degrading forests and crops;
2. Introducing improved fodder management techniques for drought periods;
3. Introduction of seed cattle as a startup livestock fund for the community through provision of seed animals;
4. Promotion of biogas as an alternative energy source for cooking to reduce forest encroachment from the firewood collection activities;
5. Creation of biogas cooking stoves;
6. Creation of home gardens and plantation demonstration plots;
7. Creation of community nursery center;

Capacity development activities:

8. Train farmers on animal husbandry practices, biogas coking stove systems techniques and maintenance;
9. Promotion and training for agribusiness development through improved value chains for selected products which are less sensitive to climate change;

Output 2.4: Post-harvest handling, storage, basic processing and quality standards of food- and cash crops and access to markets by/for farmer communities are improved.

Activities under this output aim at empowering farmer families to improve the quality and shelf-life of harvests and to strengthen the capacity to carry out milling of maize and other crops in order to increase capture a larger part of the value chain themselves. This output will complement Output 2.1 and will secure the food chain from farm to market. The improvement of the food value chain will be conducted through: reduction of post-harvest losses, implementation of more efficient processing technologies and distribution systems, capacity building of relevant stakeholders, income diversification through selling of added value products. The activities will focus on stimulating entrepreneurship among farmer families and linking them with established and emerging private sector actors in the supply chain.

Indicative activities include:

Field/community adaptation activities:

1. Build and rehabilitate community food storage systems to be more resilient to climate shocks and pest;
2. Procurement of equipment for food packaging and processing;
3. Provision of milling machines and training to increase farmers' skills on their operation and maintenance;
4. Adoption of proper post-harvest handling, storage, basic processing and quality testing at the level of the farm household, farmer group and union of farmer groups;

Capacity development activities:

5. Training of farmer communities on post-harvest handling, storage, processing and quality standards of food- and cash crops;
6. Assisting farmer groups/unions of farmer groups to establish business relationships with private- and/or public sector buyers based on fair prices.

Output 2.5 Vulnerable families protected from climate risks through micro-insurance.

Given the increasing level of climate risk faced by vulnerable households, they frequently face losses to agricultural production and to their asset bases due to floods and droughts. These shocks affect whole communities and can quickly overwhelm traditional coping strategies. To survive, households are often forced to resort to negative coping strategies, such as reducing food consumption, removing children from school, or selling productive assets during periods of stress. While these strategies ensure short-term survival, they compromise future ability to diversify and improve livelihoods.

Recognizing these risks, Indonesia enacted a law on farmer protection, including a proposed climate insurance scheme. This output will pilot such a scheme in target areas of NTB province, providing a valuable learning opportunity and basis for the Ministry of Agriculture to develop the national scheme.

The project will explore the inclusion of an insurance levy in the form of cash withheld from the transfer payment made to local farmers for the work they do under the project. This insurance scheme could be either automatic or communities could be asked to opt in or out at the community level. The exact process will be defined jointly with all concerned stakeholders during the first months of the project to ensure there is good buy-in. The insurance will provide protection to the farmers if any climate extreme events occur beyond the coping capacity of the agricultural system

The output will include the following activities:

Field/community adaptation activities:

1. Develop and test a tailored climate risk insurance product in 3-4 communities.

Capacity development activities:

2. Develop a plan for scaling up the insurance product in NTB.
3. Building the capacity of local partners to develop and scale up climate risk insurance, including the meteorological agency, the Ministry of Agriculture, insurance regulators, and private sector partners.

B. *Describe how the project / program provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and groups within communities, including gender considerations*

Dodokan watershed plays an important role for the livelihood of the people in and surrounding the watershed. Due to rapid degradation of the watershed, its buffer capacity against extreme climate events decreased. Increasing drought and flood problems have resulted. Crop failures due to the hazards have been significant and have caused hunger, malnutrition and poor health. Climate change is expected to increase and intensify the occurrence of extreme climate events over the coming years and decades. Although climate change affects everyone regardless of class, race, age or gender, its impacts are heavier on poor people and rain-dependent farming families in the area.

Gender inequality in rural areas of Indonesia means women are still disadvantaged. They have less access to information, training, credit and women-headed households lack sufficient labor power (UNICEF, 2011). On the other hand, women carry out about 75% of the farm work in rice production and provide 40% of household food supplies from vegetable gardens. The growing number and severity of disasters triggered by climate change will further increase the burden on women and communities that are already vulnerable at present. Frequent crop failure will seriously affect their livelihoods. Women and children may be forced to contribute ever more to household income, without being released from their domestic responsibilities. Education and health outcomes for children will be affected negatively. Assistance is clearly needed to build their resilience to the impact of climate change while attempting to change prevailing gender inequalities at the same time.

This project will ensure to address the development priorities for livelihoods, target the disadvantaged and most vulnerable communities. The project strategy has taken into account the physical and economic vulnerability of rain-dependent farm families. The NTB Food Security and Vulnerability Atlas (Figure 7) which comprises 9 indicators of food availability, food access, and food utilization, in combination with the risk level of harvest failure due to extreme climate events map from the study of Ministry of Environment/GIZ (Figure 12) and village areas which intersect with forest have been used to identify the most vulnerable communities in the project area.

The project aim to address two main factors which causing the increased vulnerability of the agricultural system and food security to climate variability and climate change. The first is a combination of inadequate policies and lack of capacity of local government to cope with climate variability and climate change, which results in a limited number of often insufficient or inadequate programs. The second is low capacity of communities to manage climate risk and lack of knowledge which often lead them into unsustainable farming practice and cause further damage to the environment.

In order to address both factors and achieve optimal outcomes, the project activities will be structured under two main components. Outcomes of component 1 will improve the capacity of local government and communities to manage climate risk and further address land degradation and deforestation in the area. This component will strive to address the policy and programmatic gaps, and to develop and implement integrated watershed management involving all concerned

stakeholders with strong community participation and ownership. Through this approach, activities implemented to produce outputs within the Component 1 of the project will then deliver a number of substantive **social benefits** such as:

1. Increased capacities at all levels of the project to protect and manage natural assets;
2. Increased food, nutrition and water security of rural communities;
3. Empowerment of women to contribute better to family income;
4. Community organization and social cohesion through strong farmer organizations;
5. Effective and informed service delivery to farm households;
6. Community empowerment through information, participatory planning and risk mapping;
7. Established knowledge management activities and risk assessment at community level which can give rise to number of adaptation initiative actions in communities and households (water conservation, food storage, seed preservation);

Outcomes of component 2 will seeks to build resilient livelihoods of vulnerable groups in the face of more unpredictable and damaging weather patterns and to develop alternative livelihoods to assist Government's broader efforts to address underlying drivers of land degradation and vulnerability to food insecurity and climate change. Thus, implementation of activities aimed to produce outputs in Component 2, will result many **economic benefits**, namely:

1. Increased incomes through project-related activities such as alternative livelihoods, increased crop production and cash-for-work for target communities during the lean season;
2. Increased cropping intensity and increase in percentage of irrigated land, resulting in increased production;
3. Increased capacity to cope with climate variability;
4. Reduced production and post-harvest losses due to extreme climate events;
5. Women in vulnerable households will be encouraged to undertake food-based cottage industry in target area;
6. Increased access to micro finance and skills for business management for women;
7. Reduction in economic vulnerability during lean season in households in target area;

Taken together, both implementation of policies and activities under component 1 and 2 of the project will have positive impacts

- on all <u>households</u> (through home garden development),
- <u>upper catchment</u> (forests protection and conservation and rehabilitation of degraded areas through agroforestry and reforestation) and
- <u>downstream</u> (stream bank protection, water conservation, improved irrigation facilities).

Thus, project interventions will improve the ability of the ecosystem to be more resilient despite increased climatic variation and to better sustain people's livelihoods and will deliver a number of specific **environmental benefits** that include:

1. Restoration of ecosystem integrity, provision of goods, improved micro-climate, improved soil structure, increased biodiversity and improved quality and availability of ground water

through the rehabilitation of degraded areas, home gardens, forest protection and conservation and agroforestry.

2. Reduction of erosion, sedimentation and siltation of riverbanks and village reservoirs through the improvement of soil management techniques (hedgerows, contour drains, bunds) at household and settlement levels.
3. Water conservation, stream bank protection, improved water management and irrigation water efficiency through construction of hill-top ponds, community ponds, irrigation canals and check dams. In combination with the activities under output 2.1, the above environmental benefit can also be expected to increase yields in the longer term.

The project may not be sufficient to fully halt climate change or reverse all the degradation that has resulted from it and from other drivers, but it will give local government, civil society and communities the tools and knowledge to produce those results over a longer time frame. It is expected that local actors will be fully empowered at the end of four year project duration to continue the work without significant additional external funding and with a more limited technical support. Knowledge and experience delivered from the Component 2 will create added value and adopted into the existing government program and policies, thus it will create multiplier effects in a wider areas.

C. *Describe or provide an analysis of the cost-effectiveness of the proposed project/ program*

Project implementation costs will cover activities required to address climate change-induced risks as well as the underlying drivers that have caused the degradation of land and increased the vulnerability of the community to climate change in the first place. Key characteristics of the project will considerably enhance its cost-effectiveness:

1) The menu of highly replicable, development-oriented solutions to climate variability that ensures value for money;
2) A strategy that makes the most of existing government extension services and administrative platforms by complementing and supporting their activities/objectives;
3) Implementing natural resource management and livelihood asset building activities with community participation to ensure high levels of ownership and sustainability;
4) A strategy that avoids duplication by linking with key agencies;
5) A delivery mechanism that ensures cost-effective implementation;
6) Implementation which promotes mainstreaming in local and national policy (Figure 14);
7) The use of locally available competencies and skills;

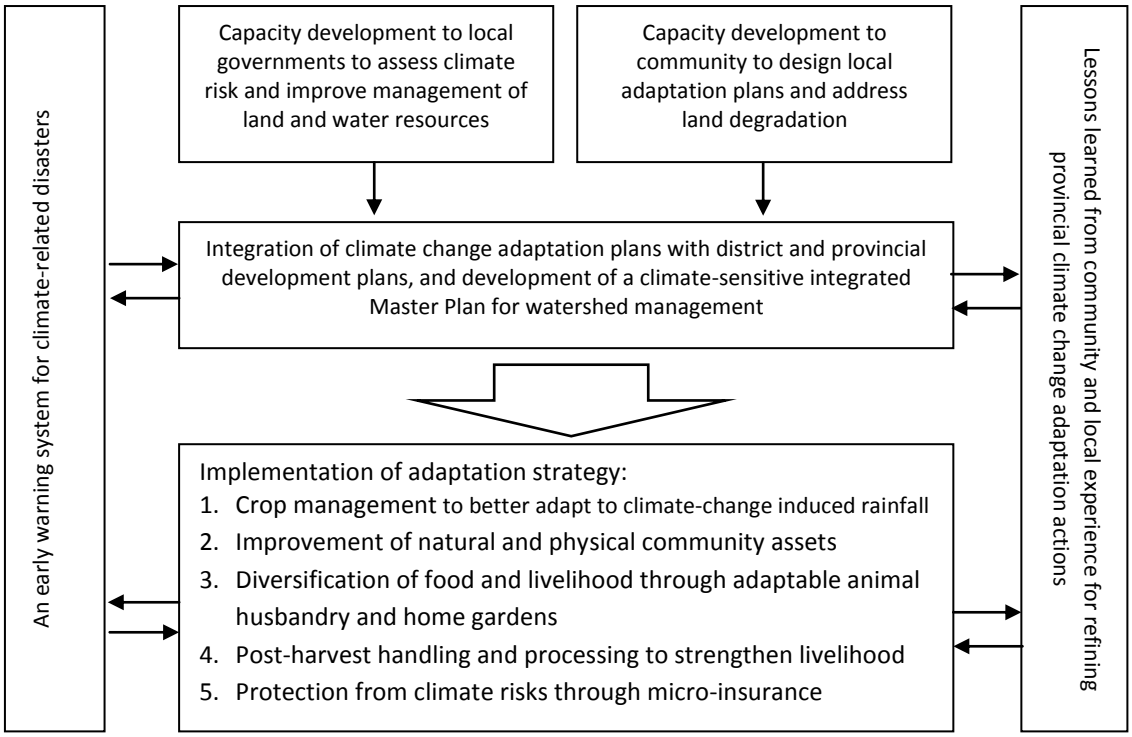


Figure 14. Approach in the implementation of project activities to ensure cost effectiveness –CR2 CR3

The effectiveness of the concrete adaptation measures put in place by the project will be tested and measured over the life of the project. This will involve cost-benefit analyses to ascertain which activities provide economically viable options for scaling up to neighboring communities.

While the project aims to influence and support policy and strategy development at the Dodokan watershed level, its planning processes and lessons learnt will provide valuable input to district-level and provincial adaptation strategy and actions.

The project will influence provincial and district efforts on water management, food security and climate change adaptation, land tenure, reduction of land degradation and deforestation. It will create a blueprint of how to bring these together under a more coordinated policy and strategy framework.

The project duration is extended to four years to provide adequate time to implement the project, including the components of knowledge transfer, early warning system and assets creation.

The project design is grounded in the need to support the National Action Plan on Climate Change and the NTB Action Plan on Food Security under a Changing Climate. These constitute the overarching framework of all related sectoral programs and policies and provide vehicles for mainstreaming project findings, best practices, and lessons learned. Thus there will be no need for new policy-making under the project, which would require a longer project duration. As the project is built on and benefits from previous findings and lessons learned from activities by various

stakeholders in NTB (Details are explained in chapter II.F), there is no need to start from scratch. Four years will give local government, civil society and communities the tools and knowledge to produce those results over a longer time frame. It is hoped local actors will be fully empowered at the end of four years to continue the work without significant additional external funding and with a more limited technical support.

The implementation of component 2 activities will be conducted in the second year after most of the outputs of 1.1, 1.2, and 1.3 have been achieved. The results from the activities under component 1 will ensure component 2 activities are implemented with the right buy-in, technical and political support from the government and the community itself. This will increase the likelihood of making investments in component 2 produce the desired return and it will also ensure sustainability as political and community leaders have had time to coalesce around the same vision and make it their own. Knowledge transfer and integration of project results into government programs will be conducted in parallel with the roll-out of community adaptation activities during the second and third years of the project. The overall causal link and synergies between outputs of this project are illustrated in Figure 14.

The adaptation options under the project were selected based on knowledge gained in the planning process that led to the formulation of the NTB Action Plan on Food Security under a Changing Climate, and also taking guidance from the National Action Plan on Climate Change Adaptation (see below). The project focuses on improvement of water management, small scale irrigation development, soil and fertilization management including organic fertilizer, and development of off-season livelihood opportunities through small-scale low-cost technological solutions. The project will establish demonstration pilots and train local technicians from communities who can participate in building, operating and maintaining those systems. Where functioning markets exist, the project will use cash-based support modalities to further increase cost efficiency. In mid-2012, WFP finalized the cash/voucher transfer feasibility study in NTB for a possible alternative incentive (other than food commodities) to local communities for use in projects building resilience through asset development. The study showed that such non-food based modalities are not only feasible, but also more cost-efficient than providing an equivalent value transfer in the form of food, given their additional benefit of stimulating the local economy. Based on this study's result, the project will use cash or vouchers as incentives for the community. Community involvement in asset development will generate durable ownership. Through appropriate training, communities will be able and willing to manage and maintain their assets when the project closes.

The decision making process for implementing the adaptation activities at the community level will be conducted through Participatory Rural Appraisal (PRA) including interviews and focus group discussions. These will be based on and validate the vulnerability analysis which has been identified during the project design phase as well as adapt it to each specific community. The participatory approach is to ensure appropriateness, ownership and sustainability of the assets created for the future. A sspecific menu of the adaptation options will be derived from the result outputs of 1.1, 1.2, and 1.3., in line with the framework of NTB Action Plan on Food Security under Changing Climate document.

During project design, several alternative interventions have been considered and were rejected for

a number of reasons. In NTB, several individual basins have surplus water resources even in areas that have reached advanced stages of development, while others face serious shortages, especially during extreme drought years. According to the Ministry of Environment/GIZ study, the watersheds of Putih and Jelateng will have water surpluses under all climate change scenarios until 2080. Improved storage capacity and inter-basin transfers of water from surplus (Putih and Jelateng) to deficit regions (Dodokan) could therefore have been an option for achieving more equitable distribution of water resources and optimal utilization of these resources. However, this option would not only be very expensive, but could also potentially draw down the surpluses of these watersheds quickly, thereby creating potential conflict between water users. Lift irrigation using pumps could also have been an alternative. This option was not considered feasible as many villages covered by the project do not have access to electricity and it would be costly for farmers to purchase fuel. Building larger water storage capacity was also an option, but in many catchments covered by the project water runoff is not sufficient even during the rainy season. And of course, building dams is highly expensive.

D. *Describe how the project / program is consistent with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, sector strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.*

The Government of Indonesia ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 23 August 1994 and submitted its first and second national communications to the UNFCCC in 1999 and 2011. The country ratified the Kyoto Protocol on 3 December 2004. To address impacts of climate change and to further translate the national communications into its annual program of work, the Government recently developed the National Action Plan on Climate Change Mitigation (RAN GRK) and Climate Change Adaptation (RAN-API).

Many land-forest based mitigation actions in RAN/RAD GRK are also adaptation actions, including rehabilitation of degraded land in prioritized watersheds through community involvement, increasing water use efficiency in rice cultivation etc. Many of the activities under this project are in line with actions promoted under RAN GRK.

RAN-API is meant to reflect the preparedness of sectors in responding to climate change and anticipating threats through programs that are based on projection of future developments. RAN-API has become the framework for cross cutting and sectoral development plans. It captures and integrates strategic planning and policies on agriculture, forestry, food security, public works, health and fisheries, including the Master Plan for the Acceleration of Poverty Reduction, or MP3KI, and Master Plan for the Acceleration of Indonesian Economic Development, or MP3EI. Food security in NTB is top priority in RAN-API. Specifically in this regard, RAN API aims to (i) develop farm enterprise systems that are climate resilient; (ii) develop and apply adaptive technology; and (iii) optimize the utilization of land, water and genetic resources. To ensure the sustainability of water supply and other environmental services for supporting agriculture and rural livelihoods, the RAN API action plan aims to (i) improve spatial planning and land use systems, (ii) manage and utilize productive area in a sustainable manner, (iii) enhance management of conservation and essential ecosystem

areas, (iv) rehabilitate degraded ecosystems, (v) reduce threats to ecosystems, and (vi) develop information systems. In addition, Infrastructure required for supporting agriculture activities (irrigation, reservoirs etc.) will be rehabilitated and climate-proofed.

In line with national policies, NTB province has also developed a strategy and action plan for reducing food security vulnerability in the face of climate change. Proposed actions focus on the application of adaptive technologies, diversification of farming activities, improvement of land and water resource management, food diversification and improvement of irrigation infrastructure. This provincial strategy and action plan has been developed in accordance with the NTB Five Year Mid-term Development Plan. It is based on the integration of program planning between a number of sectors such as Forestry, Agriculture, Food Security, Meteorology, Small and Medium Enterprise and Public Works. NTB also has established a Special Coordination Climate Change Task Force to implement the action plans from each agency.[10] However, the Task Force is constrained by a lack of knowledge on climate change risk and on translating strategy and action plans into concrete interventions on the ground. There are no climate impact studies at the watershed scale and the Task Force is not well linked with local governments and their stakeholders.

All the activities proposed in this project are designed to align with, and support the national and provincial agendas above, improve the consideration of climate change risks to ensure their effectiveness and sustainability, and strengthen the links between planning and action at local levels.

E. *Describe how the project / program meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc.*

Design, implementation and monitoring of project activities will involve technical agencies and/or their local representatives to ensure that project outputs meet relevant national technical standards in term of design and execution. Project components and outputs will meet the technical standards prescribed in agriculture, land use and forestry, water resources and watershed management. In general, project activities will meet national standards as presented in the following table:

Activities	**Activities category**	**Applicable standards**	**Relevant agencies**
Integrated land and water resource management, including irrigation improvement	Land rehabilitation and Infrastructure development and maintenance Technical standards for building water	Ministry of Forestry standard on land rehabilitation and Ministry of Environment on safeguards	Ministry of Forestry and Ministry of Agriculture Ministry of Public Works

[10] The climate change Task Force of NTB was formed through Governor Decree in early 2012. Chaired directly by the Governor and managed daily by the Head of the Food Security Agency with members constituting the heads of each related agency from agriculture, forestry, plantation, fishery and marine, industry and trade, transport, meteorology, logistics, and the provincial secretariat on economic and administration. The Task Force is mandated to prepare and review programs and actions related to food security and climate change, establish targets, timelines, and budgets, and monitor and evaluate progress.

Activities	Activities category	Applicable standards	Relevant agencies
	infrastructure and maintenance		
Design of climate information systems	Early warning systems	Seasonal forecasts are issued by the agency for climatology and meteorology Norms and standards on design and dissemination of early warning systems	National Agency for Meteorology, climatology and Geophysics Agency for disaster management
Monitoring the implementation of local adaptation measures and its impact on food vulnerability	Development of vulnerability index and monitoring system	WFP standards in food vulnerability assessment Ministry of Environment guidance of vulnerability assessment	Ministry of Agriculture Ministry of Environment

F. *Describe if there is duplication of project / program with other funding sources, if any.*

Most climate-related initiatives in NTB were assessments and were not designed to concretely address the effects of climate change on food security. They include the following:

1. GIZ in cooperation with Ministry of Environment, WWF and Provincial Government of NTB Province (2008-2009): Vulnerability and Risk assessment on Climate Change in Lombok I (no pilot).
2. WWF (2007-2009): Policy advocacy to the provincial government in order to mainstream climate change into midterm development plan and coastal community awareness on climate risk in coastal area of North Lombok (simple qualitative method).
3. CSIRO (2010-2013): study on climate futures and rural livelihood adaptation strategies in Lombok and Sumbawa islands (no pilot).
4. KOICA in cooperation with Ministry of Forestry (2009-2013): Land rehabilitation and conservation project as part of REDD+ feasibility study and AR CDM in North Batukliang, Central Lombok District (part of upper zone of Dodokan watershed).
5. USAID (2010-2014): Indonesia Marine and Climate Support (IMACS). The project aims to strengthen the management capacity of the Ministry of Marine Affairs and Fisheries (MMAF) and local government, enhance local communities and private sector engagement through open and transparent governance, and provide technical support for key activities that support marine resources management and community empowerment.

The project is built on, and benefits from, the study on risk and adaptation to climate change conducted by the Ministry of Environment/GIZ/WWF in Lombok. The project also benefits from the analysis study conducted by CSIRO on climate futures and rural livelihood adaptation strategies in Lombok and Sumbawa islands. During the design process, all stakeholders including donor funded

projects were consulted, in order to avoid any potential duplication of efforts, resources or geographical coverage, and to create synergy between ongoing initiatives.

The project will coordinate and share lessons learned with the ongoing KOICA-Ministry of Forestry on land rehabilitation and conservation project, to strengthen support to government's effort in reducing deforestation within and surrounding the project area. The project will also take appropriate lessons from the GEF project Adaptation to Climate Change through Effective Water Governance in other provinces such as SPARC in East Nusa Tenggara (NTT) Province.

The project incorporates findings and lessons learned from the WFP Food for Asset (FFA) Programme which was implemented jointly with the NTB and NTT Provincial and Districts Governments and local NGOs between 2009 and 2012. The program activities were aimed to provide the most vulnerable households with work opportunities to produce small scale agricultural and rural infrastructure assets to sustain their livelihoods and food security. Within 3 years,more than 10,000 ha of degraded land areas were rehabilitated, about 4 million trees planted. 42 units of water catchments, accommodating more than 229,000 cubic meters, and 11 km of irrigation channel system were developed, facilitating easier access to water for agricultural use and daily life. More than 14.5 km of agriculture access roads were also developed to connect farm to market. Through these pilots, more than 240,000 food insecure people in NTT and NTB Provinces received food assistance, but many more are expected to have medium and longer term gains from the community assets created.

As some of the previous FFA programmes were piloted within and surrounding the project area of Dodokan watershed in Central Lombok District, the results from these previous pilot activities is providing a valuable foundation for the project strategy and strengthens the likelihood of the project's success. While there is no longer funding beyond 2013 for the FFA pilot activities, the support from the Adaptation Fund will be very crucial to create strong added value in scaling up the previous initiative to the level of the entire watershed, to provide adequate impacts and multiplier effects in adapting to climate change as well as reducing land degradation and deforestation in the area.

Previous WFP experiences in developing PES mechanisms between communities in the upper and lower watershed will also be used as a lesson learnt in improving the mechanism and further scaling up into wider water catchment area of Dodokan in Central Lombok. (CR2)

Under the framework of RAN API and RAN GRK, the Ministry of Forestry has committed to a massive reforestation program of 1 billion trees per year with focus on Kalimantan, Sumatera, Java, NTB, NTT, and Papua.

As poverty and the lack of sustainable livelihood opportunities have been the main drivers of deforestation in the Dodokan watershed area, the NTB Forestry Agency is prioritizing a welfare approach by increasing the economic and livelihood opportunities through reforestation and community forest programs in conjunction with formal law enforcement for any illegal logging activities. Within the last five years, the NTB Forestry Agency has rehabilitated almost 50% of degraded land in NTB (223,000 ha out of total 507,000 ha), mostly in Dodokan through these programs. By 2016, the Agency aims to rehabilitate all the remaining degraded land in NTB. In

parallel, the ministries of Public Works and Agriculture have also prepared programs to revitalize and improve water management for irrigation across Lombok and Sumbawa Islands.

The proposed project will support these programs by improving government's and community capacity to adapt to climate change risks and by generating lessons on sustainable resource management.

There are also several initiatives from the community for small scale level land conservation and spring protection in the upper zone of Dodokan watershed. Most of the initiatives are driven by a strong customary law and local wisdom (*awig-awig*) enforced by the village leader. The project will built on these types of initiatives and will strongly acknowledge them as an important avenue to achieve the project objectives, especially to address the land degradation and deforestation problems, in conjunction with government's efforts to enforce the law.

G. *If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.*

The project will emphasize the capture, analysis and dissemination of lessons learnt and best practices. It is expected to generate lessons learnt that provide the government with the opportunity to review the approach and scale up successful activities.

WFP Indonesia has included knowledge management and evidence-based programming as part of its country strategy. WFP will take the lead in all activities related to monitoring, evaluation and knowledge management, in line with its corporate procedures. As part of the preparation of a full project document, an evaluation strategy will be developed and aligned to the expected outcomes of the project. Evaluation, in addition to monitoring, will provide the basis for the evidence-based approach proposed in this project. Also, the need for special studies based on the overall objectives of the project will be assessed. Knowledge management activities will draw upon national actors and capabilities as well as NGOs and community organizations.

The project has dedicated knowledge management outputs, especially targeting the dissemination of and scaling up best practices, while also generating the opportunity for spontaneous and autonomous adaptation in communities with similar ecological and socio-economic conditions. A coherent knowledge management platform will be developed and a range of knowledge products (case studies, policy papers, and technical briefs and media reports) will be widely (and publicly) disseminated.

Information and communication is also integral to technical outputs where the awareness of farmers and officials will be developed.

Vulnerability assessments of villages and households will measure adaptation impacts and behavior change and widely disseminate such information. The Ministry of Environment has developed a program called Climate Village which seeks to encourage villages throughout Indonesia to share climate-related best practices with the Ministry of Environment (in return for a reward). This

program will make an inventory of initiatives and good practices available to the project, and the proposed project's achievements will in turn be shared nationally.

H. *Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations.*

The proposed project was conceived through initial consultations with BAPPENAS as the overall national (and project) coordinating agency. This was followed by consultations with the Provincial Government of NTB, including BAPPEDA, BMKG, the Food Security Agency, the Agriculture Office, the Public Works Office and the Forestry Office. In total, there were 16 consultation meetings. In addition, 7 Farmer Group meetings were held in 4 villages between January and December 2012. A summary of the consultative process is provided in the table below. More information, particularly from local consultations, will be forthcoming in the full project document.

Consultation	Date / Place	Participants	Objective
Initial consultation with the Indonesia Climate Change Trust Fund (ICCTF), National Development Planning Agency (BAPPENAS)	2012, Jakarta	Head of ICCTF Secretariat and staff	Expressed WFP intention of developing a proposal for Adaptation Fund Board and preliminary discussion on the project concept
Meeting with Ministry of Environment (MoE)	2 May 2012, Jakarta	Deputy Assistant for Climate Change Adaptation and staff	Discussion on the project concept
Consultation with the National Designated Authority for the Adaptation Fund	3 May 2012, Jakarta	Indonesia Designated Authority and staff	Discussion on the project concept. The Designated Authority agreed to develop a proposal
Meeting with Head of Provincial development Planning Agency (BAPPEDA) of NTB	2012, Mataram, NTB	Head of BAPPEDA NTB and staff	Discussion on the project concept and brainstorming on local government development priorities.
Meeting with Head of Food Security Office (FSO) of NTB	2012, Mataram, NTB	Head of FSO NTB and staff	Discussion on food security and climate change threats in NTB and the importance of local community engagement
Meeting with the Research and Development Agency, Ministry of Agriculture	7 May 2012, Jakarta	Director General for Research and Development Agency and staff	Discussion on possible local adaptation approaches by communities.
National stakeholder workshop with key agencies	8 May 2012, Jakarta	Participants from BAPPENAS, MOE, Ministry of Agriculture, Food Security Agency, Advisor to the President, BAPPEDA	Concept was discussed and opinion and inputs from participants were obtained

Consultation	Date / Place	Participants	Objective
		NTB, and other governments agencies, NGOs, and universities	
Consultation with MOE	13 July 2012, Jakarta	Deputy Assistant for Climate Change Adaptation and staff	Further brainstorming on project concept and climate change adaptation measures
Meeting with Chairman of the Advisory Council to the President	13 September 2012, Jakarta	Chairman of the Advisory Council to the President	Discussion on food security and climate change threats and potential adaptation approach.
Community consultation with farmers in Bangket Parak village, Pujut sub district of Central Lombok District	17 October 2012, Central Lombok, NTB	Farmers Groups from Bangket Parak, Pengengat, Tanah Beak, and Loang Maka Villages	Discussion on food security-related adaptation needs and potential actions at community level.
Provincial stakeholder workshop of key provincial and districts stakeholders	18 October 2012, Mataram, NTB	Participants from BAPPEDA NTB, FSO NTB, BAPPENAS, MOE, Coordinating Ministry for People's Welfare, representatives from districts governments in NTB, NGOs, universities	Discussion of the proposal and integration into local government planning.
Meeting with the Food Security Agency Ministry of Agriculture	7 November 2012, Jakarta	Head of Food Security Agency and staff	Discussion on food security and climate change issues, including current and future government programs.
Focus group discussions with farmers in 3 sub districts - Janapria, Terara, Jerowaru (in 4 villages) of Central Lombok District	2012, Central Lombok, NTB	Farmers Groups from Loang Maka, Lando, Leming, and Ekas Buana Villages	Understanding of livelihood types in the village, coping strategies, past experiences and observations on climate, access to and understanding of climate information, main drivers of change in the village in terms of livelihood, adaptive capacity, etc.
Meeting with ICCTF BAPPENAS	23 November 2012, Jakarta	ICCTF Program Manager and staff	Discussion on the progress of the adaptation fund proposal.
Meeting with climate change expert from Bogor Agriculture Institute	Mid-December 2012, Jakarta	Director of CCROM	Discussion on climate change vulnerability assessment and the adaptation approach
Presentation of project design to ICCTF BAPPENAS	Mid-December 2012, Jakarta	Head of ICCTF and staff	Full presentation of project proposal for inputs, review and endorsement.
Meeting with the Indonesia Designated Authority for Adaptation Fund	19 April 2013	Chairman of DNPI (Designated Authority) and staff	Full presentation of project proposal for inputs, review and endorsement.

I. *Provide justification for funding requested, focusing on the full cost of adaptation reasoning.*

Component 1: Improving knowledge and institutional capacity of local governments to reduce climate risks associated with rainfall variability and their impact on community livelihoods and food security

Baseline without Adaptation Fund Support

High poverty rates and the lack of alternative livelihood options have depleted forest and natural resources of the Dodokan watershed. Under the national decentralized governance system, management of the watershed is also fragmented and actions are uncoordinated. Further, there is no common vision among local governments and other stakeholders in and surrounding the watershed on how to manage it in an integrated manner, and certainly not in ways that can allow the environment and people to withstand more unpredictable and severe weather.

Without the interventions proposed by this project, current unsustainable management of the watershed would continue and be exacerbated by climate events. This in turn would lead to more environmental degradation and greater poverty and food insecurity, thereby creating a self-reinforcing vicious cycle.

National and some local governments are already aware of the importance of improving coordination and reaping synergies from programs for addressing climate change. The National Agency for Development Planning (BAPPENAS) has established a National Coordination Team on Climate Change to coordinate the various sectoral ministries which implement climate change action plans. Some local governments have established similar bodies. For example the Government of NTT Province has established a coordination unit called SPADU overseeing all official development assistance projects and working with development partners to ensure coordination and alignment. In the case of NTB, the government and some district governments such as Central Lombok have established a Climate Task Force with a similar mandate focused on climate change. The Task Force consists of representatives from the offices of agriculture, forestry, food security, public works, fisheries, small and medium enterprise, industry and trade, logistic and meteorology. However the Task Force is constrained by a lack of knowledge in developing a strategy and action plans for climate adaptation and translating these into concrete actions on the ground.

Without this project, it is unlikely that provincial and district governments will gain an understanding of the impacts of climate variability and climate change locally and the options available and desired by local stakeholders to mitigate climate threats.

With Adaptation Fund Support (Adaptation Alternative)

Adaptation Fund resources will be used to support local, provincial and district level governments, along with community stakeholders (including user groups), to develop local plans as well as a

master plan for the Dodokan watershed which takes land use change and climate change scenarios and current and expected future impacts into account.

The proposed project will enhance the capacity of entities at provincial and district levels to assess financial implications of projected land use changes and climate change impacts and to carry out cost-benefit analysis of adaptation options. It will also strengthen law enforcement to avoid further illegal activities. These entities include BAPPEDA, Agriculture Office, Forestry Office, Food Security Office, Public Works, Watershed Management Office, NTB Task Force.

Community adaptation plans will be developed in a participatory way, ensuring that resulting actions are based on the needs and ideas of the communities themselves, so as to provide tangible and lasting results. Communities will largely be self-selected for their commitment as well as their capacity. The plans will be complemented by the establishment of village conservation agreements which function as a community forest protection mechanism. The customary law and local wisdom (*awig-awig*) available in the community will be recognized in the agreements as an important lever which needs to be capitalized on to address the land degradation and deforestation problems and to enforce the implementation of adaptation actions and their monitoring and evaluation.

A network of community volunteers will be established, and climate risk information will be made available to communities. This will build on baseline local development programs.

Training for agricultural technical teams on climate risk management for agriculture will improve their ability to provide advice to village level extension officers and farmers to cope with rainfall variability. The project will also provide these teams with IT equipment and tools for interpreting and analyzing climate information and hazard data and for accessing other related information supporting agribusiness activities. Farmer organizations will also be supported to engage in collective planning of irrigation maintenance including catchment conservation.

Capacity at all levels to design and prioritize relevant adaptation plans and to effectively allocate climate-related budgets will also be improved. Communication of relevant information on climate variability and climate change impacts and adaptation options will be facilitated. Tools required for decision making to develop the master plan toward watershed resilience in conjunction with land use management will be made available. In summary, climate variability and vulnerability will be properly addressed in the management of the Dodokan watershed and adapting to climate change will become part of the overall development agenda of NTB.

Component 2: Building climate resilient livelihoods of rain-dependent farming households in the upstream and downstream areas of Dodokan watershed in Central Lombok District, covering up to 18,000 households

Baseline without Adaptation Fund Support

Without the proposed interventions in Component 2 of the project, the government and development partners will continue to make major investments in community development without properly empowering beneficiaries to take climate change into account. As a result, the longer term

sustainability and value for money of baseline interventions will be less effective and efficient. Farming households will continue to engage in unsustainable practices such as cutting wood in high value forest areas, clearing and cultivating stream-banks and reservoir catchments and short- term cash cropping on steep slopes.

Without the interventions proposed here, these farm families will continue to face degraded environments and reduced livelihoods. They will face an even more dire situation once the impact of future climate change is accounted for. Increasing climate variability has increased food insecurity of the communities in the watershed. Shifting rainfall patterns have especially impacted traditional rain-fed farming practices. Longer periods of seasonal drought and an increase in intense rainfall is eroding soil and contributing to more frequent crop failures.

The capacity of communities and field level technical teams to respond to these developments is weak. Currently there is a rather vague interpretation of climate science at local level and climate risk screening is not a part of the normal development process. Agricultural extension services do not provide comprehensive service delivery in the field, much less do they advise farmers on tackling rainfall variability caused by climate change. Farmer organizations also lack knowledge and awareness of climate-related risks, technical knowledge for maintaining small-scale agriculture and irrigation structures and the knowledge and means to develop alternative plans.

Finally, provincial and district authorities have little concrete implementation experience of how to design and implement replicable, appropriately informed (by science and local experience) and costed adaptation alternatives.

With Adaptation Fund Support (Adaptation Alternative)

Adaptation Fund resources will be invested in communities (involving about 18,000 households) to apply 'no-regret' adaptation actions and adaptive technology based on the specific vulnerabilities and opportunities they have identified. Intensive facilitation at the community level will take place and special attention will be given to the needs of women, ensuring their active participation throughout the process. Carefully guided demonstration actions to increase climate resilience of these communities will showcase the effectiveness that will then provide scope for replication to the rest of NTB.

Non-government entities, including community service organizations and private sector firms, will be invited to play a key role in implementation through a competitive process. Much of the work requires close interaction with communities. Community service organizations are well-positioned to perform this work.

Project interventions will enable farmers to increase cropping intensity and crop productivity through adoption of new technologies (drought-tolerant and short maturing cultivars etc.). Through cash/ voucher for work schemes, farmers will have opportunities to produce small scale agricultural and rural infrastructure assets that benefit their communities. The assets will be designed to strengthen resilience to withstand anticipated shocks, and sustain livelihoods and food security.

The promotion of agroforestry (fruit, timber and other perennials) through afforestation/ reforestation in upstream degraded/ deforested land areas of Dodokan watershed will generate additional income for farm families while simultaneously reducing the pressure on forests, increasing the catchment area capacity and improving water availability and quality.

Through the establishment and implementation of village conservation agreements which also function as a community forest safeguarding mechanism designed under Component 1, the monitoring and evaluation of the adaptation activities and the protection of land and forest areas will be enforced, creating a self-police mechanism by the community for the community.

At the end of the project farming households dependent on rainfall for agricultural production will show demonstrable improvement in food consumption patterns. They will also have access to information, protection from harvest failure risk through micro-insurance, seeds and extension services to improve current cultivation practices and to cope with extreme climate events. They will be able to engage in diversified agricultural pursuits that have year-round markets. Women, who are currently confined to providing labor in farm fields in addition to their household chores, will have access to technology for post-harvest handling, storage and value-added food processing activities which will allow them to build alternative livelihoods that do not rely on land and forests only.

J. *Describe how the sustainability of the project/program outcomes has been taken into account when designing the project.*

Sustainability is at the core of the design and strategy of the project. The project aims to integrate planning for climate change resilience into provincial and district level policy, programs and budgets. This will ensure stakeholders continue their work towards the vision of climate resilience beyond the duration of this project.

This project will influence existing climate change policy, program and action plans in each working unit (*Satuan Kerja Perangkat Daerah* – SKPD) of the Central Lombok District and of NTB Province overall under the NTB Strategy and Action Plan on Food Security under a Changing Climate, 2011-2015. Activities under this project will be integrated into local government programs.

Sustainability at the community level will be promoted by ensuring that the actions are community-driven to increase ownership and commitment, and that they undergo a thorough socio-economic-environmental assessment prior to approval and implementation. Assets created under the project will be prioritized and decided through community participatory approach so that the community will be able to maintain, repair, and replace with their own knowledge, skills, and resources after the project closes. NGOs and extension services and others involved in implementation will receive proper training and implementation will be closely monitored by the project team.

Outcomes from the project will not only be sustainable because of community involvement in project design, implementation and monitoring. Community members will see concrete benefits in a variety of ways, for example through increased productivity, better access to markets, better protection from shocks through insurance. Local government will have the capacity to better

support community-driven and –owned processes. Lower watershed residents will see value in services provided by their peers in the upper watershed and will be willing to pay for those services.

Combined, both components of the project will create a virtuous cycle where good policy, improved capacity and concrete adaptation actions empower communities to adapt to the effects of climate change and to reverse the environmental damage which if unchecked would further increase their vulnerability. The knowledge and lesson learnt delivered by the project will be captured through its monitoring system, documented in accessible reports, shared and discussed with all relevant stakeholders, thus promoting the application and replication of valuable lessons in a wider scope beyond the project itself.

The sustainability of specific outputs is described below:

EXPECTED OUTCOMES	EXPECTED CONCRETE OUTPUTS	SUSTAINABILITY MECHANISM	RESPONSIBLE PARTY/IES
1. Improving knowledge and institutional capacity of local governments to reduce climate risks associated with rainfall variability and their impact on community livelihoods and food security	• 1.1. Extension workers, local government officers at village and district levels are trained and mobilized to (i) assess climate risk under different land use scenarios and (ii) improve management of land and water resources	Landscape-based assessment in the watershed will be defined through a participatory process that considers the ecological zone and community priorities to ensure ownership. Assessment results will be integrated into the NTB Strategy and Action Plan on Food Security under a Changing Climate to evaluate the matrix program proposed by sectoral agencies, with more specific focus on the programs of the forestry, food security, agriculture and public works agencies, under the coordination of BAPPEDA. Training modules generated from the activities will be integrated into the Agriculture and Food Security Offices' respective training programs for further replication	Bappeda I NTB, Bappeda II Central Lombok District, Food Security Office, Agriculture Office, Meteorological Office, Forestry Office, Public Work Office

	1.2. Community members and farmer organizations are trained and mobilized to • design and monitor the implementation of local climate change adaptation plans (that also address gender specific issues and vulnerable groups) • ensure anthropogenic causes of land degradation are addressed by the community to complement community efforts to self-police negative practices resulting in land degradation by improved law enforcement	Continuous focus group discussions, training and mobilization on water resource management and climate change adaptation plans will ensure that climate impacts are considered by the community. Enforcement will be conducted through village conservation agreements which include a monitoring and evaluation mechanism to ensure ownership and sustainability. Understanding of indigenous wisdom, knowledge and practices will be emphasized.	farmer organizations, villages and communities in Dodokan watershed
	1.3. Local food security and adaptation plans are integrated with district and provincial development plans and a climate-sensitive integrated Master Plan for watershed management is developed.	The integration of planning will be self-reinforcing across plans, and the Food Security and Agriculture Offices will have recurrent budgets to continue to support the process once the project is closed in river catchment areas	Bappeda I NTB, Food Security Office NTB and district level, farmer organizations

	1.4. An early warning system for climate-induced disasters in targeted sub-districts is designed, implemented and maintained.	Climate information systems would be developed and disseminated in conjunction with the Meteorological Office and Agriculture Office , both of which have good capacity. Findings, lessons learned, guidelines and standard operating procedures will be developed and integrated into the Meteorological Office and Agriculture Office program and budget to ensure synergy and sustainability. The improved training curricula, findings and lesson learned from the climate field school (CFS) implemented under this output will be integrated into the Meteorological Office CFS program for sustainability and further replication	Meteorological Office, Agriculture Office, Bappeda I NTB, farmer organizations
	1.5. Lessons learned from community and local experience are shared and used for refining and prioritizing provincial climate change adaptation actions	Dissemination of lessons from the field will support replication in other regions and increase knowledge among a wide group of stakeholders. They will become inputs for the evaluation of the national action plan on climate change adaptation (RANAPI) and the NTB Strategy and Action Plan on Food Security under a Changing Climate (RADKPPI)	Bappenas, Bappeda I NTB, Bappeda II Central Lombok District

Outcome 2. Building climate resilient livelihoods of rain-dependent farming households in the upstream and downstream areas of Dodokan watershed in Central Lombok District, covering up to 18,000 vulnerable households	2.1. Crop management is introduced and applied by farmer communities to better adapt to climate-change induced rainfall (and temperature) variability, causing extreme weather events such as droughts and floods.	Activities are designed to support communities to take measures to make their subsistence farming practices more resilient to extreme climate conditions. Implementation of measures will be done jointly by communities, extension services and CSOs to build trust, understanding and stimulate the exchange and blending of traditional and modern knowledge, approaches and decision making processes. The improvement of crop management practices will enhance incomes and enable farmers to maintain improved systems after the project closes.	Farmer organizations, villages communities in the Dodokan watershed; Agriculture Office
	2.2. Increased income for vulnerable families through the creation and improvement of natural and physical livelihood assets	Cash/ Voucher for Work will significantly strengthen the asset base of communities and allow them to continue to generate income and be food secure in the face of climate shocks. Active participation of the community will be at the core of the approach to ensure ownership of the assets created. Farmers' groups and communities, whose capacity has been strengthened through Output 1.2., and who will be reaping economic benefits from the assets created, will have a strong incentive to maintain them to ensure their sustainability.	Farmer organizations, villages and communities in Dodokan watershed

	2.3. Adaptable animal husbandry practices and home gardens as alternative source of income for farm families are promoted and implemented	Results will provide benefits in terms of diversifying livelihoods, food production, generating income and increasing access to protein sources in farm family diets, thereby reducing vulnerability. The combined trainings to strengthen beneficiary skills to adopt improved animal husbandry and home gardens will ensure benefits that last beyond project closure. Once the community starts reaping those benefits, it will be keen to continue to use such improved practices after the project ends.	Farmer organizations, villages and communities in Dodokan watershed
	2.4. Post-harvest handling, storage, basic processing and quality standards of food- and cash crops and access to markets by/for farmer communities are improved	This output will promote economic diversification, helping rural communities become less dependent on climate sensitive livelihoods and forest exploitation over the long-term. It will stimulate entrepreneurship among communities with an emphasis on women. It will foster close linkages with the private sector in NTB for technical assistance and market linkages to create self-sustaining trade.	Farmer organizations, villages and communities in Dodokan watershed
	2.5. Vulnerable families protected from climate risks through micro-insurance.	Activities are designed to support the national program on micro-insurance to protect the farmers from climate risks. Findings and lesson learns from the project will be adopted and up scaled by the Ministry of Agriculture into national level.	Farmers organizations, Agriculture Office, Private sector

PART III: IMPLEMENTATION ARRANGEMENTS

A. *Describe the arrangements for project / program implementation.*

The project will be executed according to the project management implementation guidelines agreed by WFP and the Government of Indonesia.

Project Management Structure

BAPPENAS will act as overall coordinating agency and Executing Partner (EP) of the project at the national level. The Provincial Development Planning Agency (BAPPEDA I) will be the EP for all outputs and activities in NTB, both at provincial and district level. The World Food Programme (WFP) will serve as the AF Multilateral Implementing Entity (MIE) of the project.

Policy guidance to the project will be provided by a **National Project Steering Committee (NPSC)** chaired by the Deputy Minister for Natural Resources and Environment BAPPENAS. The membership of NPSC will consist of technical directorates concerned from the Food Security Agency of the Ministry of Agriculture, and Directorate for Environment Degradation Control and Climate Change of the Ministry of Environment, including the Head of BAPPEDA I NTB Province, and Head of BAPPEDA II district level. It will also include a representative from WFP. The NPSC will be the highest decision-making body for the project, and will guide the overall implementation. The NPSC will meet every six months.

A **Project Management Unit (PMU)** will be responsible for management decisions. The PMU plays a critical role in project monitoring and evaluation by assuring quality in these processes and products, and using evaluations for performance improvement, accountability and learning. It ensures that required resources are committed, arbitrates on conflicts within the project, and negotiates with external bodies. Based on the approved Annual Work Plan, the PMU can also consider and approve quarterly plans (if applicable) and essential deviations from original plans.

In order to ensure WFP's ultimate accountability for the project results, PMU decisions will be made in accordance to standards that shall ensure management for development results, best value for money, fairness, integrity, transparency and effective international competition. Representatives of other stakeholders can be included in the PMU as appropriate. To support the work of PMU, a Project Assurance GROUP will also be formed. Its role is to supports the project by carrying out objective and independent project oversight and monitoring functions.

The PMU will be based in BAPPENAS Jakarta and NTB Provincial BAPPEDA in Mataram (capital of NTB province). It will consist of a Project Manager, Project Assistant, Finance Associate, Administrative Assistant, and representatives from technical level staff of Bappenas and BAPPEDA I NTB. The Project Manager has the authority to run the project on a day-to-day basis on behalf of the Executing Partner (EP) within the constraints laid down by the NPSC. The Project Manager's prime

responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost.

The PMU will, among other tasks, i) Develop Standard Operating Procedures for project implementation, ii) Develop quarterly and annual work plans and budgets, iii) provide financial and administrative management support to activities in NTB, including allocation of funds to districts based on specific criteria, and overall program budget oversight, iv) prepare quarterly and annual financial and technical progress reports to be submitted to the NPSC, v) ensure compliance with applicable WFP /Government rules and regulations. The PMU will be supported by **technical experts** (international Chief Technical Advisor and national experts) who will provide technical expertise to the project. In the implementation of specific activities, the PMU can receive assistance from NGOs/CSOs.

Field Level Project Support Unit (PSU)

At the field level, a Divisional-level Project Support Unit will be created. For cost-effectiveness this will be housed within the Divisional Secretariat or a divisional unit of BAPPEDA II District Level. The field level PSU will have one full time staff supported by the project execution budget to coordinate between the different divisional actors and farmer organizations.

WFP Country Office Support Services

As per standard agreement between WFP and the Government of Indonesia, and upon request from the Executing Partners, WFP can provide support services to the EP for the procurement of goods and services and recruitment of project staff.

A summary of the project management structure is presented in Figure 15 below.

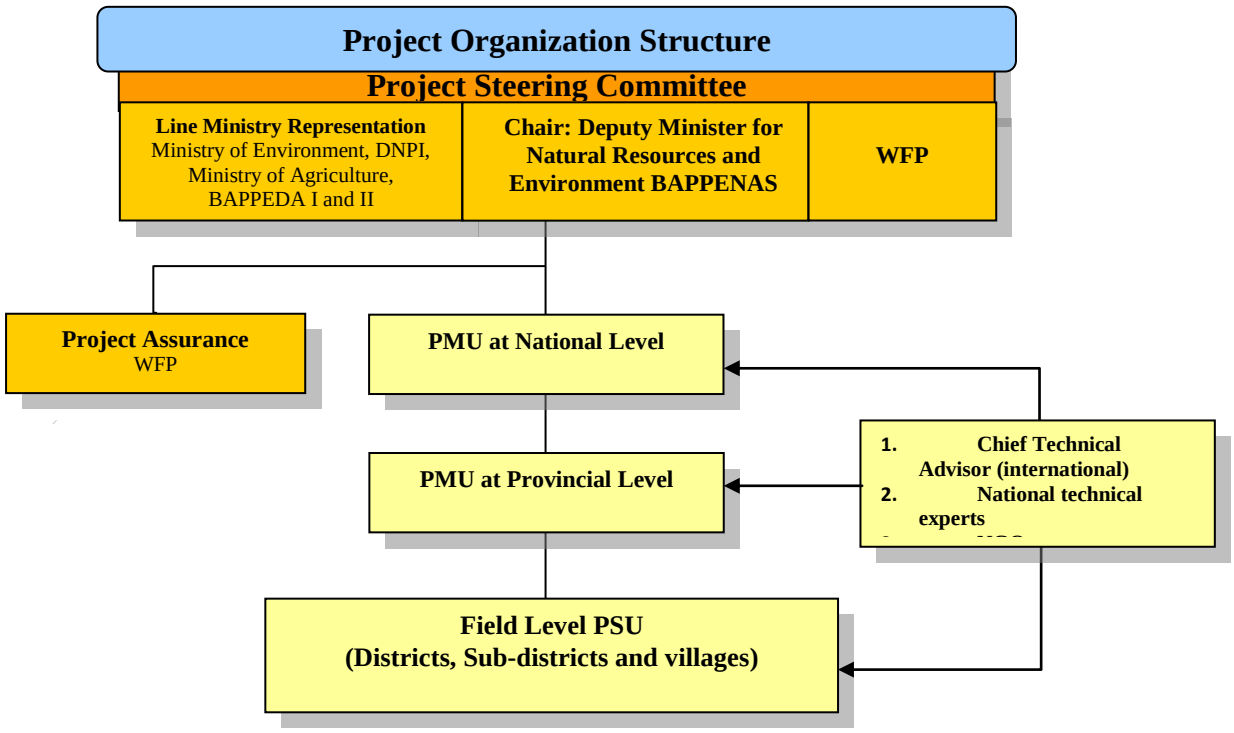


Figure 15. Project organization structure

B. *Describe the measures for financial and project / program risk management.*

The proposed project is based on strong government support at national and local level and can draw on lessons learned from the past. The greatest risks are 1) inertia against change from the key-stakeholders including parliament, government officials, extension workers, and communities having a preference to conduct business as usual, and 2) inability to effectively coordinate the many agencies to be directly and indirectly involved.

To mitigate these risks, the project will work closely with the highest authorities in NTB to mobilize support from government agencies, and will invest in establishing / strengthening coordination mechanisms at provincial and district level for addressing climate change. It will also communicate regularly with national government authorities such as the National Development Planning Agency (BAPPENAS) to showcase progress made and ensure political support. At the local level, the project will collaborate with local stakeholders (government agencies, NGOs, university) in supporting participatory approaches that stimulate a shift in thinking at the community level, and assist these communities to bring their needs to the attention of, and share best practices with, extension staff and district level planning authorities.

In terms of environmental risks, unfavorable climatic conditions may occur during the project life cycle and impact on the investments made by the project. An important assumption is that these climatic extremes will be within coping range and that existing institutions and community groups will rapidly absorb and act on the new skills, technical approaches and knowledge acquired through the project. More details on risks and assumptions are provided in the table below

Risk	Rating	Mitigation measures
Coordination among government agencies will be ineffective due to the large number of government institutes involved, capture by sectoral interests, and multiple reporting lines	**Low**	This risk will be mitigated by strong leadership from senior government officials, highlighting the opportunities and benefits of cooperation across agencies and other partners. The project has already started to map out relevant shared interests across agencies. Information will be broadly shared to identify synergies and opportunities for cooperation, and minimize the risks of competition and duplication. Further multi-stakeholder discussions will focus on identifying common issues, and finding pathways towards common goals and actions.
Bureaucratic processes hamper the active involvement of government institutes in project activities	**Low**	The project will put a premium on gaining assurance and firm buy-in from both senior management and their staff, providing training and coaching, and showcasing the value of involvement for day to day work and progress.
Some communities are unwilling to participate and prefer to continue business as usual in a traditional farming practice and cause further	**Medium**	Communities will largely be self-selected for their commitment as well as capacity. Also, the introduction of new ideas and innovation will be carried out in a participatory way, ensuring that resulting actions are based on the needs and ideas of the communities themselves and provide tangible results. A premium will be placed on communication through field based demonstration, training

Risk	Rating	Mitigation measures
deforestation and land degradation		and learning. Village conservation agreement will be put in place to ensure the enforcement and sustainability of the activities, and to create a community forest safeguarding. The project will recognize the customary law and local wisdom (*awig-awig*) available in the community and will strongly acknowledge and use it as an important capital to develop the conservation agreement to address the land degradation and deforestation problems, in conjunction with government's efforts in enforcing the law.
Extreme climate events take place during the project which are beyond the coping range of the targeted communities and measures introduced	**Low**	Detailed vulnerability assessments at district and community level will be carried out in advance of the full project appraisal to understand the resilience of the communities and the type, frequency and severity of extreme climate events that may likely occur in the districts. Technical experts responsible for the detailed design of adaptation measures will ensure that measures to be introduced are robust and appropriate for the capacities and climate risk profile of the communities.

C. *Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan. Include break-down of how Implementing Entity's fees will be utilized in the supervision of the monitoring and evaluation function.*

A project Inception Workshop will be held to launch the project with those in assigned roles in the project organization structure, WFP office and where appropriate/feasible regional technical policy and program advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan. The Inception Workshop should address a number of key issues including:

1. Assist all partners to fully understand and take ownership of the project. Detail the roles, support services and complementary responsibilities of WFP vis à vis the project team. Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff will be discussed again as needed.
2. Based on the project results framework and relevant Tracking Tool if appropriate, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks.
3. Provide a detailed overview of reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed and scheduled.
4. Discuss financial reporting procedures and obligations, and arrangements for annual audit.
5. Plan and schedule Project Board meetings. Roles and responsibilities of all project organization structures should be clarified and meetings planned. The first Project Board meeting should be held within the first 12 months following the inception workshop.

An Inception Workshop report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

Quarterly:

Progress made shall be monitored in the WFP Management Platform. Based on the initial risk analysis submitted, the risk log shall be regularly updated in Food Security & Vulnerability Atlas of Indonesia (FSVA; WFP 2010) and Food and Nutrition Security Monitoring System. Risks become critical when the impact and probability are high.

Based on the information recorded in FSVA, a Project Progress Reports (PPR) can be generated in the Executive Snapshot.

Annually:

Annual Project Review/Project Implementation Reports (APR/PIR): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period.

The APR/PIR includes, but is not limited to, reporting on the following:

1. Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative)
2. Project outputs delivered per project outcome (annual).
3. Lesson learned/good practice
4. Other expenditure reports
5. Risk and adaptive management
6. Portfolio level indicators are used by most focal areas on an annual basis as well

Periodic Monitoring through site visits:

WFP will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the Project Board may also join these visits. A Field Visit Report will be prepared by the WFP and will be circulated no less than one month after the visit to the project team and Project Board members.

Mid-term of project cycle:

The project will undergo an independent Mid-Term Evaluation at the mid-point of project implementation. The Mid-Term Evaluation will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term evaluation will be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term evaluation will be prepared by WFP.

End of Project:

An independent Final Evaluation will take place three months prior to the final Project Board meeting and will be undertaken in accordance with WFP guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term

evaluation, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The Terms of Reference for this evaluation will be prepared by the WFP. The Terminal Evaluation should also provide recommendations for follow-up activities and requires a management response.

During the final three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

Learning and knowledge sharing:

Results from the project will be disseminated within and beyond the project intervention are through project-supported and existing information sharing networks and forums.

The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects. Finally, there will be a two-way flow of information between this and related projects.

M&E work plan and budget

Monitoring and Evaluation (M&E) will take place in line with WFP guidelines. The following table gives a tentative distribution of the budget over the main items.

	Responsible Parties	**Budget US$** *Excluding project team staff time*	**Time frame**
Inception Workshop and Report	PMU	Indicative cost: 18,000	Project start-up
Periodic status/ progress reports	Project manager and team	Part of PMU cost	Quarterly
Mid-term Evaluation	Project management team WFP External Consultants (i.e. evaluation team)	Indicative cost: 30,000	At the mid-point of project implementation.
Final Evaluation	Project management team WFP External Consultants (i.e. evaluation team)	Indicative cost : 30,000	At least three months before the end of project implementation
Project Terminal Report	Project manager and team WFP local consultant	None	At least three months before the end of the project

	Responsible Parties	Budget US$ *Excluding project team staff time*	Time frame
Audit	WFP Project manager and team	Indicative cost per year: 5,000 (total US$ 20,000)	Yearly
Visits to field sites	WFP Government representatives	For ICCTF supported projects, paid from IA fees and operational budget	Yearly
TOTAL indicative cost Excluding project team staff time and WFP staff and travel expenses		US$ 100,000 (+/- 5% of total budget)	

D. *Include a results framework for the project proposal, including milestones, targets and indicators and sex-disaggregate targets and indicators, as appropriate. The project or program results framework should align with the goal and impact of the Adaptation Fund and should include at least one of the core outcome indicators from the AF's results framework that are applicable*[11].

Alignment with the AF results framework is shown in Annex 2.

Program strategy:	**Objectively verifiable indicators**				
Goal	The overall objective of the project is to secure community livelihoods and food security against climate change-induced rainfall variability and more intense and frequent extreme climate events The project has two components. The first component is designed to improve climate-related knowledge and institutional capacity at village, district, and provincial level in developing and implementing integrated watershed management involving multi stakeholders and community participation. The second component seeks to build resilient livelihoods of vulnerable groups and to develop alternative livelihood options in the face of more unpredictable and damaging weather				
	Indicator	**Baseline**	**Target**	**Sources of verification**	**Assumptions and Risks**
Component 1: Improving knowledge and institutional capacity of local governments to reduce climate risks associated with rainfall variability and their impact on	Number of knowledge products and policy for supporting decision making and capacity building activities on land and water resource	Limited knowledge and lack of understanding on climate change, its risks and impacts; limited capacity in identifying and developing relevant	By the end of the project, local governments and community are able to develop and implement landscape based-watershed management plans which incorporate effective climate risk management.	▪ Knowledge products, ▪ Policy support tools ▪ Capacity building activities ▪ Climate-sensitive, landscape based-	Assumption: local governments and stakeholders in and surrounding the watershed are willing to work together in developing

[11] Please refer to the *Project level results framework and baseline guidance* for the Adaptation Fund's results framework and guidance on developing a results framework and establishing a baseline [add link here].

community livelihoods and food security	management and effective climate risk management	adaptation strategies and actions		integrated watershed management Master Plan. ▪ Local climate adaptation plans	integrated, climate sensitive, watershed management plans. Risk: climate change measures are long term and the project may not capture all change in ecosystem vulnerabilities
Output 1.1: Extension workers, local government officers at village and district levels are trained and mobilized to • assess climate risk under different land use scenarios • improve management of land and water resources	Availability of assessment of climate risks in Dodokan watershed system under different land use scenarios Number of extension workers and local government officers trained and mobilized	Not available	▪ Assessment of climate risks under existing land use, and different land use scenarios (current spatial plan and land use projection) is available ▪ Policy makers local and planners are able to use the climate risk assessment in informing local adaption plans and designing the forthcoming Master Plan (see below)	▪ Knowledge products on climate risk assessment ▪ Report on refinement of spatial plan of the watershed and landscape-based activities programs	Assumption: Good long historical projection of climate data is available Historical land use and socio-economic data driving land use change are available Risk: Climate uncertainty cannot be managed due to unavailability of assemble climate models Trained people will be transferred to other positions which are not related to climate resilience

Output 1.2: Community members and farmer organizations are trained and mobilized to • design and monitor the implementation of local climate change adaptation plans (that also address gender specific issues and vulnerable groups) • ensure anthropogenic causes of land degradation are addressed by the community to complement community efforts to self-police negative practices resulting in land degradation by improved law enforcement	Number of local adaptation plans developed Number of village conservation agreements developed Number of community members, and farmers organization trained and mobilized	Not available Little to no human resource capacity in this area	▪ Local adaptation plans are developed ▪ Village conservation agreements are developed ▪ Community members, farmers organization, extension workers and local government are trained and mobilized to manage local adaptation plans including conservation agreements	▪ Climate sensitive local plans ▪ Village agreements ▪ Prototypes/pilot projects designs are developed	Assumption: All related stakeholders engage in the process of design and are willing to absorb and apply new knowledge and systems Risks: Conflicting interests among parties and and/or poor understanding of climate change issues

Output 1.3: Local food security and adaptation plans are integrated with district and provincial development plans, and a climate-sensitive integrated Master Plan for watershed management is developed.	Number of adaptation plans accommodated in district and provincial plans and in the Master Plan. Availability of a Master Plan for the Dodokan watershed	Existing plans do not adequately address climate risks. No climate-sensitive, integrated Master Plan exists	▪ Local food security and climate adaptation plans are incorporated into district and provincial development ▪ A Master Plan for the Dodakan watershed is developed	• Climate sensitive Master Plan is developed and adopted by provincial and district governments • Local adaptation plans are reflected in the Master Plan and other development plans	Assumptions: Senior government officials and politicians give priority to addressing climate change Risks: Provincial and/or district governments fail to agree on a Master Plan which incorporate local risks and proposed risk reduction measures
Output 1.4: An early warning system for climate induced disasters in target sub-districts is designed, implemented, and maintained.	• Adoption of climate early warning systems that are available at national level reflecting local conditions • Availability of an early warning system that is relevant to local risks	A number of initiatives on-going at national level, to be adopted at local level. However, due to lack of capacity and unclear dissemination mechanism the technologies are not adopted by farmers and local governments. Also, local threats have not been addressed well in the nation-wide system	Relevant climate information system is designed and institutional mechanism for dissemination is established Climate technical team and climate field school are implemented for 100 farmers groups.	▪ Design and accessibility of relevant climate information system ▪ Institutional mechanism for disseminating climate information is established ▪ Technical team is operationalized and able to translate climate information into operational action; Local governments are willing to	Assumption: Climate information is accessible and reliable Risks: Institutional mechanism and resource for supporting managing climate risk is not available

				establish climate technical teams	
Output 1.5: Lessons learned from community and local experience are shared and used for refining and prioritizing provincial climate change adaptation actions	Number of lessons learned documents are shared and adopted for refining and prioritizing climate change adaptation actions at national and provincial level	Limited capacity of key stakeholders at local level to effectively prioritize adaptation programme and distribute funding	Relevant lessons learned for national and provincial level (publications, training, on-line and video)	• Project reports • Media campaigns	Assumption: Incentives to share locally and receptivity for up-take nationally remains high; media interest in climate adaptation remains high Commitment of developing partners to provide financial support for climate change actions continues Risk: Overt political motivations in prioritizing programme or or funding
Component 2: Building climate resilient livelihoods of rain-dependent farming households in the upstream and downstream areas of Dodokan watershed in Central Lombok District, covering up to 18,000 vulnerable	Number of physical constructions, natural assets and alternative livelihoods provided to vulnerable households Reduction of land degradation and deforestation	Inadequate or not available	Up to 18,000 rain-dependent households are involved in building assets and developing/diversifying livelihoods	• Project reports	Assumptions: Sufficient technical capacity and human resources can be mobilized at the local level to implement project activities; communities are committed and able

households					to invest time and effort and willing to manage forests more; project adaptation measures are effective enough to reduce the effects of extreme climate events on lives and livelihoods. Risks: Project may face delays with community action plans because of disagreements within communities about priorities and beneficiaries; communities may be unwilling to participate and prefer to continue business as usual
Output 2.1: Crop management to adapt to climate-change induced rainfall (and temperature) variability, causing extreme weather events such as droughts and floods, is introduced and	Number and type of improved agricultural practices to adapt with the climate change risks Income addition	Farmers still conducting conservative agricultural practices	Farmers are able to adjust their agricultural practices to climate change risks. Technology and approach to improve crop management are adopted by farmers.	• Project reports	Farmer organizations, which represent the largest and most climate vulnerable segment of the rural population in the district, are motivated to invest time and efforts in

applied by farmer communities.					project implementation at village level. Information and adaptation technologies are appropriate for the target areas
Output 2.2: Increased income for vulnerable families through the creation and improvement of natural and physical livelihood assets	Number of physical constructions and natural assets created Income addition	Not available	Critical land and forest are rehabilitated and conserved, and could provide improved environmental services to farming practices and other alternative livelihoods of the community	• Project reports	Assumptions: Selected livelihood options are complimentary to state and other development interventions for better livelihood targeting; community interest and investment in the off-season activities
Output 2.3: Adaptable animal husbandry practices and home gardens as alternative sources of income for farm families are promoted and implemented – CR4	Number and type of animal husbandry and home gardens created – CR4 Income addition	Not available Limited traditional animal husbandry practice	Vulnerable groups in the Dodokan watershed attain income (or greater incomes) and diversified food source from the animal husbandry and home gardens –CR4	• Project reports	Assumptions: Communities are motivated to invest time and effort in developing their animal husbandry and home gardens. Level of interest in local service delivery to encourage and follow up on

					livelihood diversification –CR4
Output 2.4: Post-harvest handling, storage, basic processing and quality standards of food- and cash crops and access to markets by/for farmer communities are improved.	Number and types of post-harvest technologies applied Income addition	Limited knowledge on post-harvest processing technologies and linkage to market	Post-harvest facilities and technologies and linkage to market are available and the knowledge and capacity of the farmers to run the process is sufficient	• Project reports	Assumption: Local government and buyers support the business created from post-harvest Risks: insufficient human and financial resources for running the process
Output 2.5: Vulnerable families protected from climate risks through micro-insurance.		Not available		• Project reports	Assumption: Farmer groups and insurance companies support the initiative and willing to participate. Risks: insufficient knowledge within the farmers on insurance scheme may lead to several misunderstanding during the implementation process

E. *Include a detailed budget with budget notes, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.*

This will be provided at the full project appraisal stage

F. *Include a disbursement schedule with time-bound milestones.*

An indicative schedule can be found in Annex 3

PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. RECORD OF ENDORSEMENT ON BEHALF OF THE GOVERNMENT[1] *Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/program, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/program proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/program:*

Prof. Ir. Rachmat Witoelar *Executive Chair of the National countril on Climate Change / Indonesia* *Designated Authority for the Adaptation Fund*	Date: *August, 23, 2013*

B. IMPLEMENTING ENTITY CERTIFICATION *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/program contact person's name, telephone number and email address*

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans and subject to the approval by the Adaptation Fund Board, understands that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/program.	
Implementing Entity Coordinator *Nils GREDE* *Deputy Country Director* *World Food Programme – Indonesia*	
Date: *August, 23, 2013*	Tel. and email: +62 21 570 9001 *nils.grede@wfp.org*
Project Contact Person: Chandra Panjiwibowo	
Tel. And Email: +62 21 570 9001 chandra.panjiwibowo@wfp.org	

LIST OF ANNEXES

Annex 1. Endorsement letter from the Designated Authority

EXECUTIVE CHAIR
NATIONAL COUNCIL ON CLIMATE CHANGE

Jakarta, 19 April, 2013

Our Ref. : E-17/EC-NCCC/04/2013
Attachment :
Subject : Endorsement for Adapting to Climate Change for Improved Food Security in West Nusa Tenggara Province

To:
The Adaptation Fund Board
Adaptation Fund Secretariat
c/o Global Environment Facility

In my capacity as designated authority for the Adaptation Fund in Indonesia, I confirm that the above national project proposal is in accordance with the Government of Indonesia priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Indonesia.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by World Food Programme (WFP) and executed by Provincial Government of West Nusa Tenggara and Indonesia Climate Change Trust Fund – National Development Planning Agency (ICCTF – BAPPENAS).

Sincerely,

Rachmat Witoelar
Executive Chair
National Council on Climate Change/
Indonesia Designated Authority
for the Adaptation Fund Board

Annex 2. Alignment of Project Objectives/Outcomes with Adaptation Fund Results Framework

Project Objective(s)	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator
To secure community livelihoods and food security against climate change-induced rainfall variability and more intense and frequent extreme climate events	Number of knowledge products for supporting policy making and capacity building activities on land and water resource management and effective climate risk management	**Outcome 2:** Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.1. No. and type of targeted institutions with increased capacity to minimize exposure to climate variability risks
	Number of physical constructions, natural assets, and alternative livelihoods provided to vulnerable households	**Outcome 5**: Increased ecosystem resilience in response to climate change and variability-induced stress	5. Ecosystem services and natural assets maintained or improved under climate change and variability-induced stress
		Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	6.1 Percentage of households and communities having more secure (increased) access to livelihood assets 6.2. Percentage of targeted population with sustained climate-resilient livelihoods
Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**
Increased knowledge and capacity of local communities and governments to manage climate risks and full ownership of adaptation measures in communities in targeted district and watershed	Number of capacity building activities for local government in developing and implementing local adaptation plans and measures, and a climate-sensitive integrated watershed management plan and adaptation measures	***Output 2.1***: Strengthened capacity of national and regional centers and networks to respond rapidly to extreme weather events	2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events
Diversified and strengthened livelihoods and sources of income enable vulnerable farmers and landless rural families to tackle the climatic and anthropogenic drivers of vulnerability and enhance the community's ability to use climate information for managing climate risks.	Number of households benefiting from improved assets and diversifying income sources to cope with climate risks	***Output 5:*** Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	5.1. No. and type of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type of assets)
		Output 6: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.1 Percentage of households and communities having more secure (increased) access to livelihood assets 6.2. Percentage of targeted population with sustained climate-resilient livelihoods

Annex 3. Project Implementation Schedule (INDICATIVE)

Components and Outputs	Year 1				Year 2				Year 3				Year 4			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Component 1																
1.1. Extension workers, local government officers at village and district levels are trained and mobilized to (i) assess climate risk under different land use scenarios, (ii) improve management of land and water resources	→															
1.2. Community members and farmer organizations are trained and mobilized to (i) design and monitor the implementation of local climate change adaptation plans that address gender specific issues and vulnerable groups, (ii) ensure anthropogenic causes of land degradation are addressed by the community to complement community efforts to self-police negative practices resulting in land degradation by improved law enforcement	→															
1.3. Local food security and adaptation plans are integrated with district and provincial development plans, and a climate-sensitive integrated Master Plan for watershed management is developed.		→														
1.4. An early warning system for climate-related disasters in target sub-districts is designed, implemented and maintained.		→														
1.5. Lessons learned from community and local experience are shared and used for refining and prioritizing provincial climate change adaptation actions.							→									
Component 2																
2.1. Crop management is introduced and applied by farmer communities to better adapt to climate-change induced rainfall (and temperature) variability, causing extreme weather events such as droughts and floods.					→											
2.2. Increased income for vulnerable families through the creation and improvement of natural and physical livelihood assets.					→											
2.3. Adaptable animal husbandry practices and home gardens as alternative sources of income for farm families are promoted and implemented.						→										
2.4. Post-harvest handling, storage, basic processing and quality standards of food- and cash crops and access to markets by/for farmer communities are improved.								→								
2.5. Vulnerable families protected from climate risks through micro-insurance.					→											

Annex 4. Projection of seasonal rainfall in Indonesia based on the analysis of 28 General Circulation models (GCMs) under different scenarios of Representative Concentration Pathways (RCP)

Note: The map shows the projection under the scenario of RCP 2.6, 4.5, 6.0 and 8.5

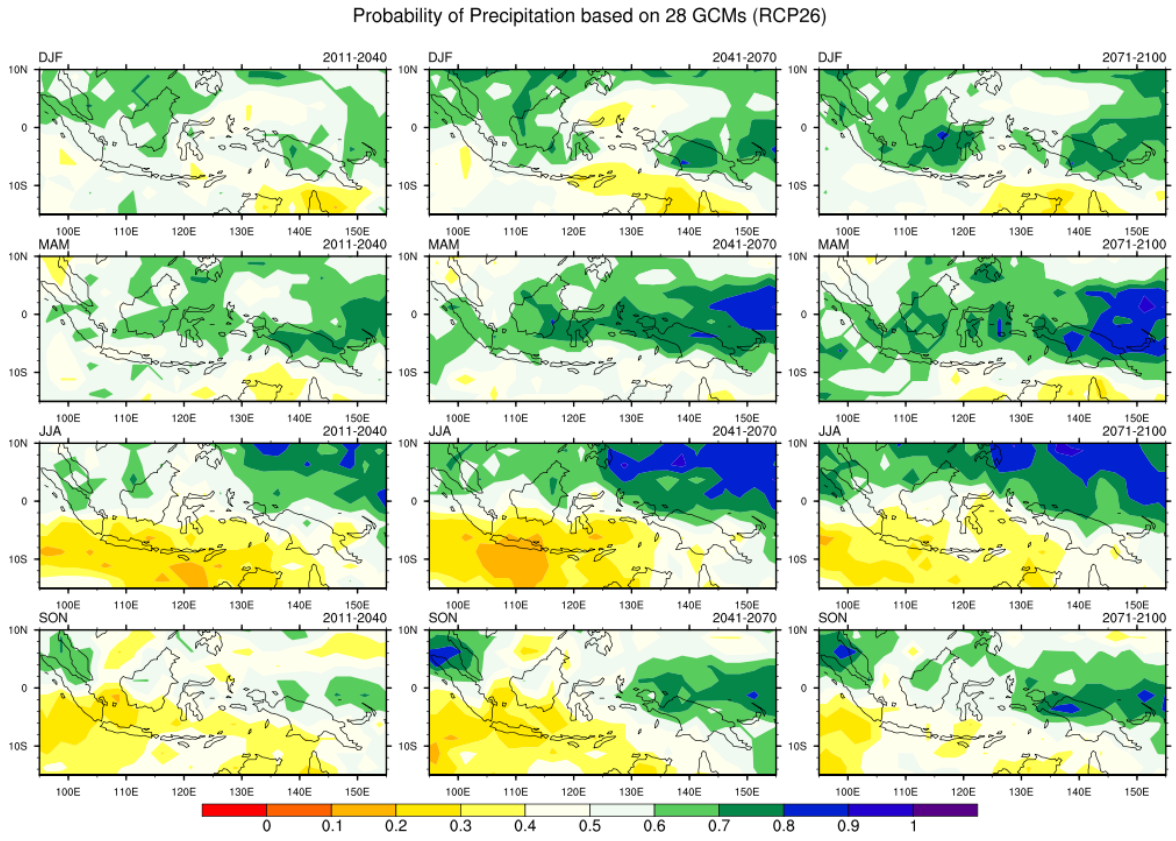
Red color on the map represents all GCMs analysis consistently proves a decrease in seasonal rainfall. **Dark blue color** on the map represents all GCMs analysis consistently proves an increase in seasonal rainfall. **White color** on the map represents half of the GCMs show a decrease and the other half show an increase.

DJF: December-January-February

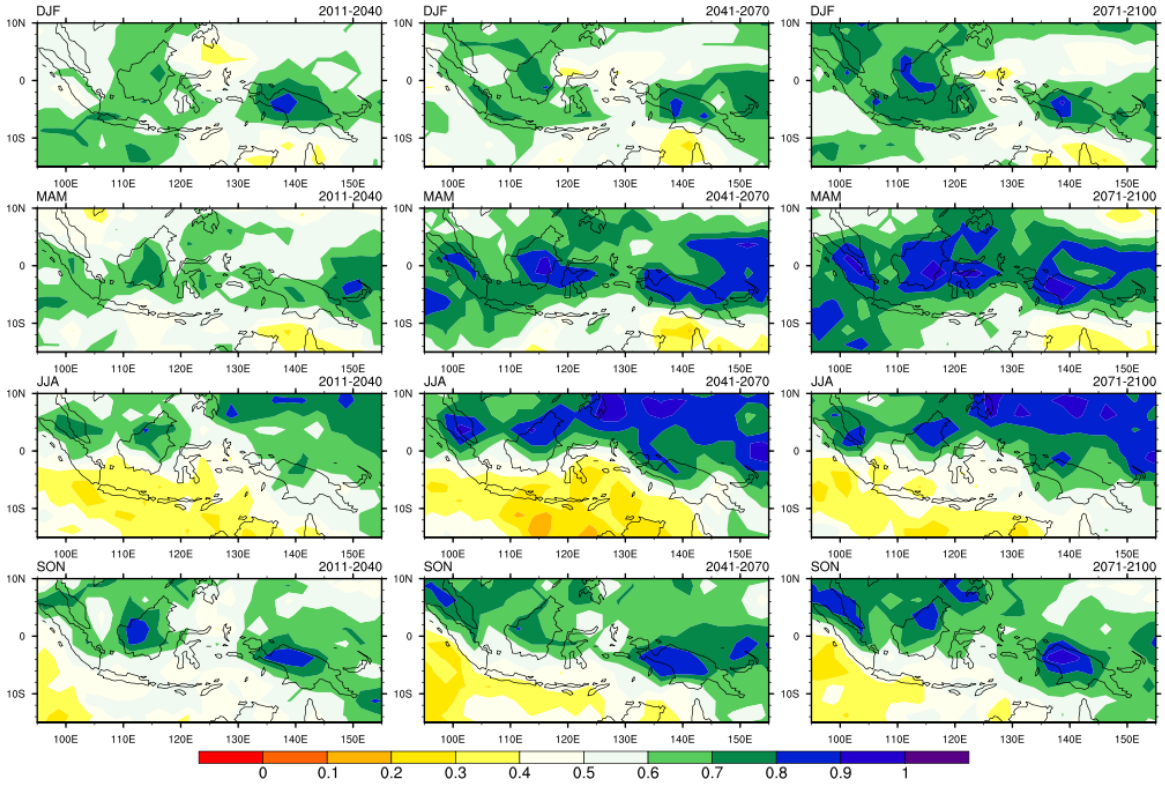
MAM: March-April-May

JJA: June-July-August

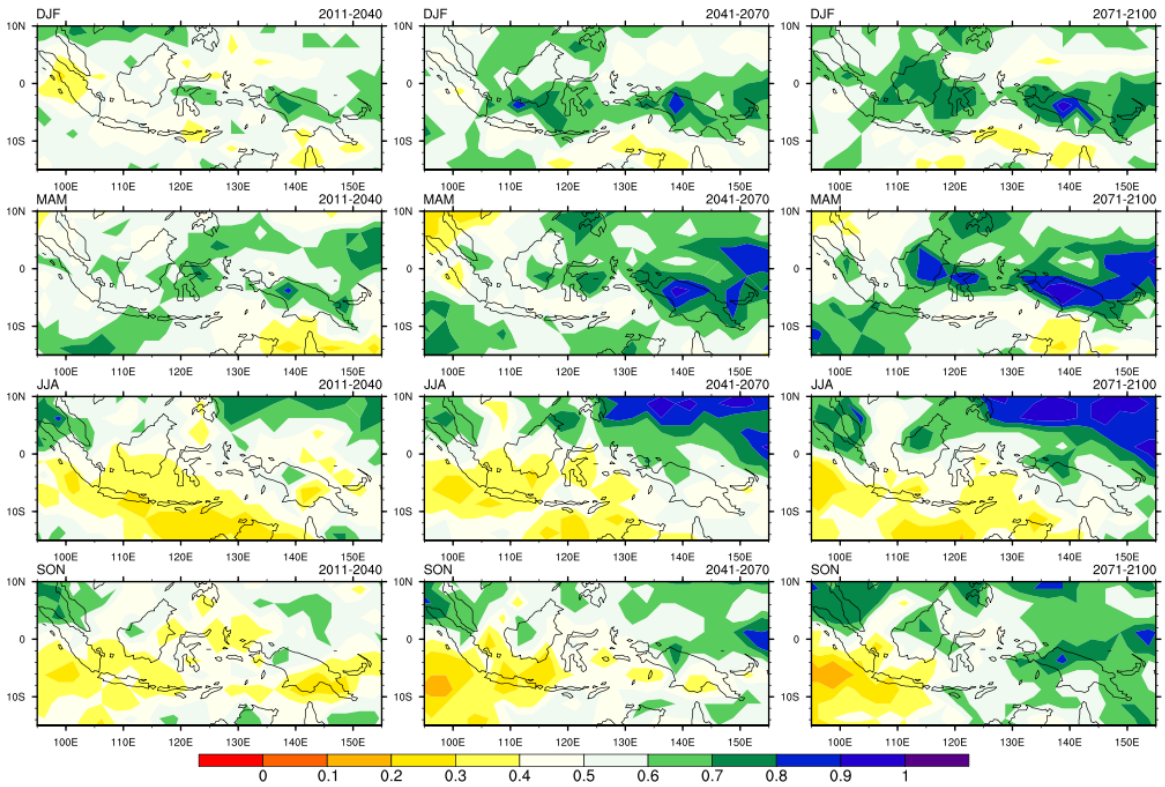
SON: September-October-November

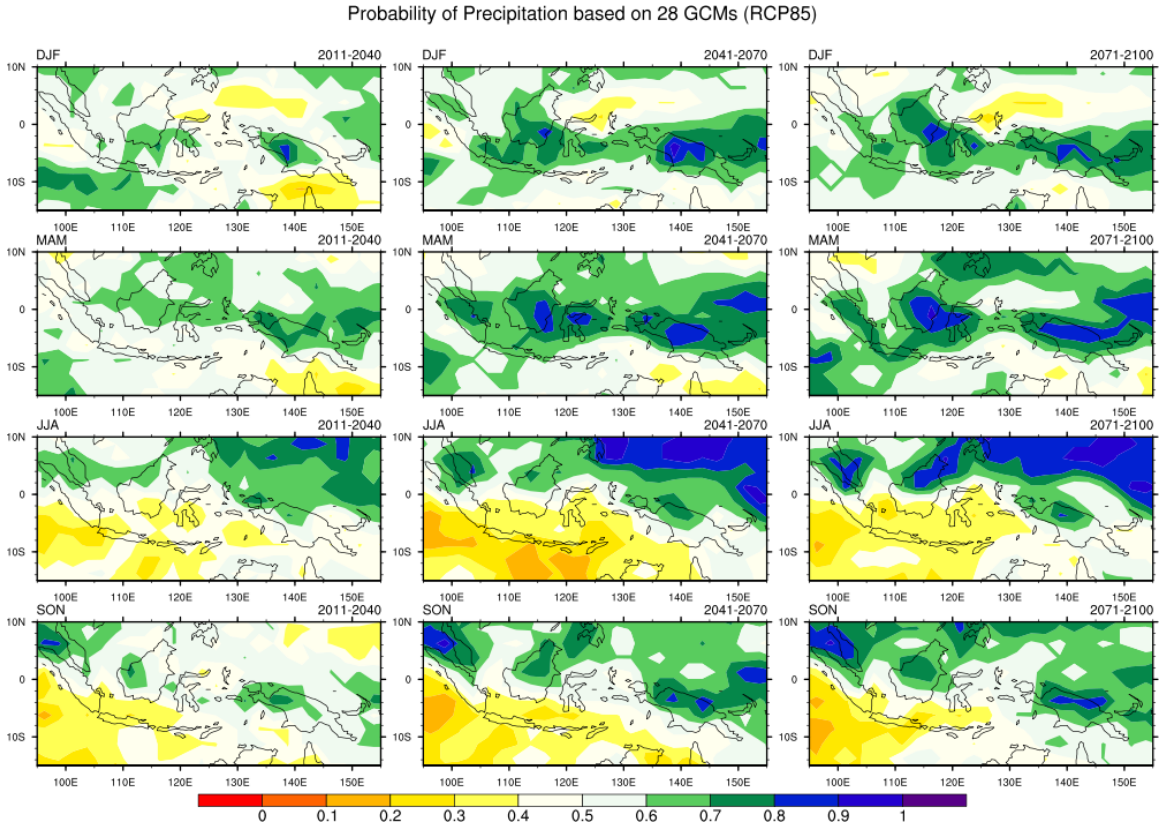


Probability of Precipitation based on 28 GCMs (RCP45)



Probability of Precipitation based on 20 GCMs (RCP60)




Probability of Precipitation based on 28 GCMs (RCP85)
DJF
2011-2040
2041-2070
2071-2100
MAM
JJA
SON
10N
0
10S
100E
110E
120E
130E
140E
150E
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

EXECUTIVE CHAIR
NATIONAL COUNCIL ON CLIMATE CHANGE

Jakarta, 19 August 2013

Our Ref. : E-33/EC-NCCC/08/2013
Attachment : -
Subject : Endorsement for Adapting to Climate Change for Improved Food Security in West Nusa Tenggara Province (second submission)

To:
The Adaptation Fund Board
Adaptation Fund Secretariat
c/o Global Environment Facility

In my capacity as designated authority for the Adaptation Fund in Indonesia, I confirm that the above national project proposal is in accordance with the priorities of the Government of Indonesia in implementing adaptation activities to reduce adverse impacts of, and risks posed by, climate change in Indonesia.

Accordingly, I endorse the above project proposal for support from the Adaptation Fund. The project proposal has been reformulated taking into account the observations in the review sheet annexed to the notification of the Adaptation Fund Board's decision B.21/8. If approved, the project will be implemented by the World Food Programme (WFP) and executed by the Provincial Government of West Nusa Tenggara and the National Development Planning Agency (BAPPENAS).

I thank you for your kind attention.

Sincerely,

Rachmat Witoelar
Executive Chair
National Council on Climate Change/
Indonesia Designated Authority
for the Adaptation Fund Board