

Concept Note

Strengthening the resilience of smallholder agriculture to climate change-induced water insecurity in the Central Highlands and South Central Coast regions of Vietnam

Vietnam | United Nations Development Programme (UNDP)

27 December 2017



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Concept Note

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Project Title: **Strengthening the resilience of smallholder agriculture to climate change-induced water insecurity in the Central Highlands and South Central Coast regions of Vietnam**

Country: Vietnam

National Designated Authority (NDA): Ministry of Planning and Investment (MPI)

Accredited Entity (AE): United Nations Development Programme (UNDP)

Date of first submission/
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version number: 2017-12-26 [V.1]

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PROPOSAL | 2017

A. Project Information			
A.1. Project or programme	<input checked="" type="checkbox"/> Project <input type="checkbox"/> Programme	A.2. Public or private sector	<input checked="" type="checkbox"/> Public sector <input type="checkbox"/> Private sector
A.3. Is the CN submitted in response to RFP?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If yes, specify the RFP:	A.4. Confidentiality	<input type="checkbox"/> Confidential <input checked="" type="checkbox"/> Not confidential
A.5. Indicate the result areas for the project	<u>Mitigation:</u> N/A <u>Adaptation:</u> Increased resilience of: <input checked="" type="checkbox"/> Most vulnerable people and communities <input checked="" type="checkbox"/> Health and well-being, and food and water security <input type="checkbox"/> Infrastructure and built environment <input type="checkbox"/> Ecosystem and ecosystem services		
A.6. Estimated mitigation impact (tCO₂eq over lifespan)		A.7. Estimated adaptation impact (number of direct beneficiaries and % of population)	1,329,040 beneficiaries in five provinces; Dak Lak, Dak Nong, Ninh Thuan, Binh Thuan and Khanh Hoa; 24% of total population of the five provinces
A.8. Indicative total project cost (GCF + co-finance)	Amount: USD 164,508,883	A.9. Indicative GCF funding requested	Amount: USD 29,749,077
A.10. Financial instrument requested for GCF funding	<input checked="" type="checkbox"/> Grant <input type="checkbox"/> Reimbursable grant <input type="checkbox"/> Guarantees <input type="checkbox"/> Equity <input type="checkbox"/> Subordinated loan <input type="checkbox"/> Senior Loan <input type="checkbox"/> Other: specify _____		
A.11. Estimated duration of project:	a) disbursement period: 5 years b) Repayment period, if applicable: N/A	A.12. Estimated project lifespan	6 years
A.13. Is funding from the Project Preparation Facility requested?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Other support received <input type="checkbox"/>	A.14. ESS category	<input type="checkbox"/> A or I-1 <input checked="" type="checkbox"/> B or I-2 <input type="checkbox"/> C or I-3
A.15. Is the CN aligned with your accreditation standard?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A.16. Has the CN been shared with the NDA?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
A.17. AMA signed (if submitted by AE)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	A.18. Is the CN included in the Entity Work Programme?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
A.19. Project rationale, objectives and approach of programme/project	<ol style="list-style-type: none"> In Vietnam, climate-driven changes in precipitation are leading to hotter and wetter wet seasons and hotter and drier dry seasons resulting in increasing deficits in surface and ground water availability for agricultural production with longer periods of severe water scarcity during the dry season and increased intensity of droughts. As a consequence, overall agricultural productivity is falling, with the corresponding declines in yields and incomes particularly harmful to small-scale farmers vulnerable to reduced water availability on rain fed lands. Two of the region's most vulnerable to climate risks are the Central Highlands and South Central Coast. This project will empower vulnerable smallholders in these two regions – particularly women and ethnic minority farmers - to manage increasing climate risks to agricultural production by securing water availability, adopting climate-resilient, water-efficient agricultural cropping systems, and using climate, agricultural and other information effectively for agroecosystem risk assessment and concomitant water and agricultural planning and management. GCF funding will ensure that smallholders have access to sufficient, reliable water supply to overcome rainfall variability and drought by connecting them to eight large-scale irrigation systems to be built through the <i>Water Efficiency Improvement in Drought Affected Areas (WEIDAP)</i> project financed by GoV 		

with an ADB loan (USD 125,075,722). The project will also support rain-fed smallholders around the irrigation areas to invest in supplementary water sources to cope with increasing water insecurity due to climate change. Furthermore, through Farmer Field Schools (FFS), smallholders will be capacitated to adopt and scale-up appropriate climate risk mitigation measures to cope with water insecurity, and learn methods and practices of managing soil, water and crop genetic resources to ensure ongoing, iterative adaptation to evolving climate change risks. To ensure lasting smallholder adaptation to on-going climate change, smallholders must continue to invest in water security and resilient agricultural systems; this project will invest GoV and targeted GCF resources in producing and disseminating agro-climate and market information and advisories and enabling smallholders through training to access credit and markets. This project is aligned with national climate, agricultural and development policies, as well as Vietnam's Intended Nationally Determined Contribution, and will be implemented by the Ministry of Agriculture and Rural Development.

B. Project details

B.1. Context and Baseline

3. Agriculture and water resources are the foundation of the livelihoods of about 64% of the people in the Central Highlands, especially the ethnic minorities accounting for about 33% of the region's population. The population of ethnic minorities is unevenly distributed across the five provinces of the Central Highlands and South Central Coast regions with the majority in the Central Highland provinces of Dak Lak and Dak Nong (20% - 30% of the population) and of Ninh Thuan with similar levels, and a smaller number in the South Central Coast provinces of Khanh Hoa and Binh Thuan (5.7% and 7.4% of the total population, respectively). Indigenous ethnic minorities in South Central Coastal provinces are mainly Cham, Raglei, and Chau Ro, while those in the Central Highlands include E De, Gia Lai and Mo Nong (M'Nong). Immigrant ethnic minorities to the target area are mainly Tay, Nung, Thai, Muong, H'Mong, K'Ho, and Chu Ru.¹
4. The Central Highlands are susceptible to changes in water availability in the dry season when there is little rain and low river flow. Only about 27.8% of the region's agricultural land is irrigated, and farmers are forced to exploit groundwater for irrigation. The Central Highlands region constitutes Vietnam's largest perennial crop zone, where smallholders produce coffee, pepper, cashew, rubber, tea, and a variety of fruit, primarily for market. In addition, they produce rice, maize and cassava, chiefly for local consumption, especially for the poorest. Farmers in the region currently intercrop perennial crops or combinations of perennial and annual crops as a strategy to mitigate the risk of drought and market price fluctuation. However, under increasingly extreme climate change-induced drought, farmers' coping strategies are progressively less effective. During droughts, groundwater levels can plunge throughout the region to 80-100 m in depth. Many farmers drill 3-4 wells but are still unable to obtain sufficient water, augmenting their dependence on increasingly variable rainfall.
5. Around 48% of the people in the South Central Coast region rely on agriculture for their livelihoods, and sufficient, reliable water sources are particularly critical as the South Central Coast is the driest area of the country with a long dry season, the lowest rainfall, and a relatively small river system. Only around 30% of agricultural land is irrigated, leaving many farmers reliant on rainfall. Under climate change, droughts in the region are becoming more extreme, and it's anticipated that many of the poor/near-poor² are likely to face food insecurity and increasing poverty. In both regions, there is a strong positive correlation between vulnerability and poverty, gender inequality and membership in an ethnic minority. Ethnic minority populations have lower average literacy rates and lag behind national averages in key socio-economic development indicators. Ethnic minority women are less likely to be represented in community leadership and decision-making processes.
6. ***Climate Change in Vietnam:***³ Average annual temperatures increased in Vietnam by 0.62°C in the period 1958-2014, with temperatures increasing by 0.38°C over the last 20 years compared to the period 1981-1990.⁴ Changes in precipitation patterns include a 15-20% increase in the wet season, and 10% decrease in the dry season,⁵ thus contributing both to wetter wet seasons and drier dry seasons, with shifting seasonality and increased risk of severe droughts.
7. Climate change-induced rainfall variability and droughts are leading to reduced water availability for smallholder agriculture, resulting in increasing declines in agricultural production. These impacts are being particularly felt in

¹ Poverty Situation Analysis of Ethnic Minorities in Vietnam 2007-1012. Irish Aid, CEMA, UNDP. Hanoi, 2013.

² Viet Nam has adopted a multi-dimensional poverty approach since 2016 for the period 2016-2020: it considers not only shortage of income but also deprivation in five basic social services (health, education, housing, WASH and information). See details in Prime Minister Decision 59/2015/QĐ-TTg dated 19 November 2015.

³ For further detail, please see the Pre-feasibility Study, annexed to this document, section 1.2 *Observed and projected climate variability and change*.

⁴ MoNRE (2016). Climate Change and Sea Level Rise Scenarios for Vietnam. Summary for Policy Makers. Triangulated with: IMHEN, UNDP (Ibid.), and J.J. Katzfey, J.L. McGregor, and R. Suppiah (2014). High-resolution Climate Projections for Vietnam. Technical Report. IMHEN, CSIRO.

⁵ Ibid.

the Central Highlands and South Central Coast regions of Vietnam, where droughts, although projected to occur less frequently, are also expected to become more extreme and last longer when they do occur.

8. ***Climate Change induced water insecurity affecting smallholder agriculture:*** Key impacts of climate change on the Central Highlands and South Central Coast relate to water availability and its effect on agricultural productivity.⁶ Overall, for both regions, a slight increase in availability of water is expected in the warm-wet and hot-wet scenarios due to an expected increase in rainfall. However, inter-seasonal differences will become larger with higher rainfall than currently occurs in the wet season and less water availability in the dry season, requiring adequate storage options. Under the hotter scenario, water shortages caused by increased demand and higher evaporation will occur.⁷ The highest risk for water availability in both regions is extreme drought. As droughts, will likely be longer and more severe, farmers are expected to depend on groundwater resources 15% of the time, and groundwater extraction is expected to increase.⁸ Water availability for rain fed crops in upland areas and with limited storage options will remain constrained or decline. The crop-water balance is under threat during extreme droughts and in the hottest scenario when rainfall declines and evaporation increases.
9. Climate change is expected to severely impact agricultural productivity in both regions. Crop productivity will be most impacted by reduced water availability during longer dry seasons, extreme droughts and under the hotter scenario. Extreme drought periods can result in 40 to 70 percent less water available for crops, especially affecting perennial crops. Crop yields in upland areas will be negatively impacted by seasonal changes (e.g. delayed onset of the rainy season) and more unpredictable precipitation patterns.⁹ For the main crops currently cultivated in both regions, vulnerability for observed and projected climate conditions has been analysed¹⁰ in the Pre-feasibility Study accompanying this Concept Note (see pages 27-29). Rice¹¹, and perennial crops such as coffee¹² and pepper¹³ and annual crops such as maize, are the most vulnerable. Monoculture farming systems are particularly vulnerable to changing temperature and precipitation patterns. Upland rain-fed crops are vulnerable to seasonal changes, including imbalanced rainfall distribution and unseasonal rainfall. All crops will be affected by increased rainfall variability and extreme weather events such as droughts, particularly during flowering, fruiting and harvesting periods. For maize and rice, yields are projected to decrease under climate change.
10. Small-scale farmers with plots of less than 1.0 ha, who are dependent on one or two rain-fed crops a year, are most vulnerable to climate change impacts. Women make up the majority of manual labor on these small farms, particularly as men increasingly migrate to urban areas in search of wage labor. The labor burden of these women further increases during periods of water stress as they are required to spend more time and energy to source water not only for irrigation but also for domestic consumption. Various inter-agency assessments conducted during the recent drought confirm that women and girls are more severely affected than men and boys¹⁴. Women and ethnic minorities face multiple barriers to their full participation in improving productivity and climate resiliency of smallholder agricultural and water management. Major barriers preventing women from adopting or influencing household and community climate resiliency strategies are factors such as: women's heavy workloads in terms of domestic and caring work, as well as production; lower recognition of women's work; an imbalance towards lower-valued farming work with women and marginalized farmers of both Kinh and ethnic minorities proportionally over-represented on the production side of the value chain; limited decision-making power in the community and at governance level, with men and the Kinh majority playing the dominant role; significant difference between men and women, ethnic minorities and other marginalized groups in terms of education and literacy; lower participation of women compared to men in community meetings or attending extension services trainings; and unequal access to and control over resources such as market and climate information, technical support, agricultural inputs, productive land, climate smart technologies, flexible finance, means of transport and communication, etc.¹⁵ Apart from other shared characteristics with other marginalised

⁶ GoV (2012). National Climate Change Strategy, and USAID (2017). Fact sheet. Climate change risk profile. Vietnam.

⁷ ADB (June 2017). Climate Risk Assessment and Management for the Project 'Water Efficiency Improvement in Drought Affected Provinces'.

⁸ ADB (June 2017). Climate Risk Assessment and Management for the Project 'Water Efficiency Improvement in Drought Affected Provinces'.

⁹ Hien Thi Thu Le, Thang Nguyen Ngoc and Luc Hens (November 2015) (Ibid.)

¹⁰ Source of crop information: ICEM (February 2014), Impact and Adaptation Study. Agriculture Report. USAID Mekong ARCC Program; and FAO (2004), Fruits of Vietnam, <http://www.fao.org/docrep/008/ad523e/ad523e05.htm>

¹¹ Suzanne K. Redfern, Nadine Azzu and Jesie S. Binamira (2016). Rice in Southeast Asia: Facing Risks and Vulnerabilities to Respond to Climate Change.

¹² ICEM (February 2014), (Ibid.), and Jeremy Hagger and Kathleen Schepp (February 2012). Coffee and Climate Change. Impacts and options for adaptation in Brazil, Guatemala, Tanzania; and Vietnam. GIZ and University of Greenwich Natural Resources Institute, Working Paper Series No.4 on Climate Change, Agriculture and Natural Resources.

¹³ Kandiannan K., Krishnamurthy K. S., Anke Gowda S.J., Anandaraj M., (January 2014). Climate change and black pepper production.

¹⁴ GoV-NGO-United Nations joint damage and needs assessments for the drought emergency (April 2016); and UNDP (July 2016), Vietnam drought and saline water intrusion: transitioning from emergency to recovery. UNDP policy analysis. Verified by field consultations.

¹⁵ ADB (July 2017). WEIDAP Project. Poverty and Social Assessment Report, UN Women and Institute for Family and Gender Studies (2016). Female Farmers and Inclusive Growth in Vietnam; and CARE International in Vietnam (July 2015). Win-win results. Gender equality in climate change programming. Learning Series Issue 1. Verified by field consultations.

groups, specific barriers to ethnic minority participation (particularly indigenous groups) include unsustainable traditional farming practices and non-fluency in Vietnamese of the Kinh majority, and low literacy in general (particularly regarding technical information tailored to them).

11. **Baseline Efforts and Investments:** Over the past two decades, GoV has channeled a large portion of public agricultural investment to irrigation with a focus mainly on water intensive rice systems aimed at ensuring long-term food security. Irrigation was then extended to cover higher value crops that help enhance farm income, including fruit and other perennial crops. However, current irrigation systems were not designed to meet the challenges and impacts of changing weather and climate change and do not necessarily reach the most vulnerable. A number of investments have been planned to modernize irrigation systems, and water pricing for irrigation will be re-applied starting July 2018, as per the newly issued Irrigation Law to incentivize water use efficiency.
12. All districts in both the Central Highlands and South Central Coast regions have benefitted from past investments in medium to large scale rural infrastructure, including irrigation systems, rural water supply, and drainage. The Government has supported irrigated agriculture with 65-70% of public agricultural investment over the period 2009-2015. GoV invested heavily in reservoir development to retain rainfall in the upper catchments for delivery to the coastal area where rice-dominated irrigation systems are found, but the sustainability of these investments is at risk from low water productivity and the impacts of climate change.¹⁶ The GoV has comprehensive plans to build or modernize reservoirs, dams, sluices and other large water and irrigation infrastructure. This includes large scale loan programs funded by the World Bank and the ADB, including the modernization of key irrigation schemes through the planned ADB-financed *Water Efficiency Improvement in Drought Affected Provinces, (WEIDAP)* project, which will serve as water-delivery infrastructure and leveraged co-financing for the GCF project proposed here (please see Output 1 under Section B.2 for more details). Note that this underlying water delivery infrastructure does not provide for last-mile connections to vulnerable farmers in these regions.
13. Government, development partners and private sector support to conventional agricultural modernization and value chain development are considerable, particularly for high value crops and in areas well connected to markets (please see section 4.2.2 of the Prefeasibility Study for detailed listing and description of ongoing efforts by GoV and NGOs to improve agricultural production, including in relation to value chain development). However, farming systems and strategies remain more focused on volume of agricultural outputs than on quality, using resource-intensive and non-climate-resilient practices, whose long-term application results in water and soil degradation. The shift to more resilient and sustainable agricultural production systems is still limited, and inclusion of poor smallholders – particularly women and ethnic minorities - is a particular challenge. The attached Pre-feasibility Study describes the most relevant past and ongoing programs and projects for the five target provinces, in line with the country's policy framework (see pages 41-56 under Section 3 *Past and Ongoing Efforts to Improve the Lives and Livelihoods of Small-scale Farmers in the Central Highlands and South Central Coast*).
14. This project contributes to the Government's framework for meeting its Paris Agreement targets and will complement other potential GCF-funded pipeline projects such as the forestry mitigation concept under development "*Achieving emission reductions in the Central Highlands of Viet Nam to support National REDD+ Action Programme goals.*" That project is led by FAO and planned to be implemented through the current UN-REDD partnerships involving UNEP and UNDP. Lessons learned in current UN-REDD implementation in target areas, and particularly in the Central Highlands, will be explored, as will partnerships with technical agencies during implementation.
15. **National Climate Change Response:** The first comprehensive program on climate change in Vietnam, the *National Target Program to Respond to Climate Change (NTP-RCC)*, was issued in 2008. It stressed the need to mainstream climate change responses into social and economic development, while pursuing broader sustainable development and taking into account gender equality and poverty reduction. Once the *National Climate Change Strategy* was approved in 2012, the *NTP-RCC* concluded and became the *National Action Plan on Climate Change 2011-2020*. The *National Climate Change Strategy (NCCS) for 2011-2020* recognizes that climate change brings significant risks to food security and agricultural development, human health, natural resources and ecosystems, and overall sustainable development. The strategy links the response to climate change to greenhouse gas emissions reduction and a shift towards a low-carbon economy but prioritizes adaptation due to Vietnam's current stage of development. The *NCCS* and *National Action Plan on Climate Change 2011-2020* outline a large number of priority actions, including upgrading the hydro-meteorological forecasting and early warning systems; restructuring agricultural systems towards more climate-resilient crops and husbandry, guaranteeing food and income security; modernizing farming practices, applying more water and energy-efficient techniques and integrated farming systems; and sustainable management of water resources, with repair and improvement of dams, reservoirs and irrigation systems.

¹⁶ Water Efficiency Improvement in Drought-Affected Provinces (WEIDAP), Viet Nam (TA 9147-VIE): Project Preparation Consultancy Services. Mid Term Report 2017

16. ***Adaptation Solution:*** With continued growth of climate variability and change, Vietnam's current coping strategies for climate change-induced water insecurity affecting agricultural productivity are increasingly ineffective and require transformational adaptation investments to achieve lasting climate resilience among smallholder farming households. The adaptation solution proposed here focuses on two mutually reinforcing elements: (i) access to sufficient water for agricultural production including through large-scale and supplementary irrigation and (ii) climate-resilient cropping systems that use water efficiently on irrigated and rain fed lands. For smallholders in the Central Highlands and South Central Coast regions to build and sustain the resilience of their agroecosystems in the face of increasing rainfall variability and drought, they will need to access sufficient water for crop production through irrigation, where possible, and through improved soil and water management on rain fed lands; and smallholders will need to be able to plan and manage cropping systems that make efficient use of water. However, to enable climate-risk informed planning and management for resilient agricultural production in light of water insecurity, the smallholders need access to climate information and agricultural advisories so they can apply mitigation options that will enhance both resilience and productivity of their agro-ecosystems. With access to climate information, including weather forecasting, and training, smallholders can understand climate risks and their agroecosystem vulnerabilities, identify and implement mitigating crop, soil and water management measures, and carry out climate-informed planning and decision-making to sustain climate-resilient agricultural production over time. Access to markets and credit is fundamental to sustain the transformational change towards climate-resilient production systems over the years, enabling farmers to develop micro-small farm enterprises and then re-invest the ensuing profits in inputs to maintain the climate-resilience of their agro-ecosystems. To achieve this adaptation solution, however, several barriers must be overcome:

Climate change-induced rainfall variability and drought are increasing the need for greater investment in reliable sources of water to enhance climate-resiliency of agricultural production.

17. Most poor/near-poor farmers in the Central Highlands and South Central Coast regions have no or very limited access to reliable sources of water and must cope with water scarcity under conditions of climate-driven rainfall variability and drought. During severe and prolonged droughts, smallholder farmers are unable to access sufficient water to maintain agricultural productivity since existing irrigation systems are unable to meet the corresponding growth in demand for water, and alternative sources such as rivers, streams, ponds and wells are easily depleted or insufficient. While Government is continuing to invest in baseline infrastructure to bring water for irrigation more broadly to the affected areas, fiscal constraints impede investments in the additional costs of ensuring smallholder connectivity to this infrastructure and their subsequent efficient use of water resources for agriculture. For poor/near-poor smallholders in the two regions, investment in connectivity, storage, and efficient irrigation equipment is limited given their weak financial capacities, which are further undermined by climate change. Although technologies exist to improve water productivity, adoption by poor/near-poor farmers has been hindered by a lack of awareness, technical knowledge and financing, including difficulties accessing credit or being able to repay loans.

Farmers are unable to apply appropriate climate-resilient water and agricultural management practices owing to insufficient information and weak technical capacities for climate risk management.

18. In both target regions, agricultural policy has been focused on producing higher yields while neglecting longer term adaptability of agriculture to climate change. Most farmers in these regions are aware of changing temperature and precipitation patterns and increasing intensity and frequency of extreme weather events such as droughts. Although farmers increasingly apply conventionally modern practices and inputs to agricultural production and water management, these are progressively less and less effective in coping with the growing variability in rainfall and other climate hazards. The majority of farmers use water inefficiently. Cropping systems are less diverse with a bias towards more climate-vulnerable monocultures, and traditional knowledge of such climate-resilient farming systems as inter-cropping, agroforestry and integrated crop-animal systems using non-rice crops is undervalued. Smallholders generally lack information and knowledge of how to improve productivity of irrigation, soil and nutrient management, and crop diversification with the aim of enhancing and maintaining climate-resilience of agro-ecosystems. Although demand exists, most farmers have never received or participated in a training event on climate risk and vulnerability analysis, farm resource planning and management, resilient agricultural techniques, or water efficiency practices. Women and ethnic minority farmers are particularly disadvantaged in that they tend to be poorer and less educated with some ethnic minorities suffering from lack of fluency in the majority Kinh language and women having less decision-making authority. Furthermore, agricultural extension agencies have limited technical capacities to support climate-risk management and resilient agriculture. Current MARD capacity to provide climate-risk informed agricultural and water management information and capacity building to climate-vulnerable smallholders is limited. Presently, extension services lack capacity to systematically generate and disseminate climate and other information that is relevant to vulnerable smallholder farming systems – or that is accessible to ethnic minority farmers - as well as to design and deliver training in climate-resilient agriculture and water management

Smallholders have limited access to timely, integrated and actionable agro-climatic information for on-farm climate risk-informed water management and agricultural planning.

19. Although conventional agricultural extension is available to farmers throughout the Central Highlands and South Central Coast, GoV has been unable to provide sufficient, appropriate climate and weather information to help smallholders to manage climate risk and adapt to the impacts of climate change. Demand for localized, reliable, timely and integrated climate and agricultural information is very high among poor farmers in the target regions, especially for ethnic minority farmers. Across the country, projects aimed at providing climate information have invested primarily in building capacity and information systems at the national level but have done limited work to build the capacity of provincial, district and commune meteorological and agricultural staff, and even less so with mass organizations. Poor, smallholder farmers with rain-fed crops, who are highly vulnerable to rainfall variability and extreme weather events, need adequate and timely information to help limit their risks. The main channels to receive information on weather, early warning and climate change for farmers in both regions is television, although for a minority it is more through the village loudspeaker system and community meetings. The more upland and remote the farmers are, the more they rely on the village leader and on fellow farmers to share information.
20. Climate and weather information received through television is too general, not downscaled enough for decision making at the local level. Information on rainfall or drought is not linked to actionable advice on how to mitigate or prevent damage to crops. Information transmitted through the loudspeaker system or from GoV staff is perceived as not timely, unpredictable, scattered, with limited integration, difficult to understand or interpret, and not reaching sufficient numbers of farmers, particularly the most marginalized i.e. women, ethnic minorities, poorer Kinh farmers. In addition, most information is developed in a top-down manner without much involvement of farmers or without building on farmer learning and experience, resulting in a mismatch between available information and user requirements.¹⁷ Technical advice on water saving, seasonal calendar changes or cropping techniques are developed by local authorities and distributed through television and extension services, however, they do not reach all vulnerable groups nor are they detailed enough or actionable. A majority of ethnic minority farmers confirm that they have not received any information or advice from the local authorities during the recent drought¹⁸

Farmers have limited access to credit and market information to sustain diversification of technologies and practices for resilient agricultural production in light of increasing water insecurity

21. Enhancements to the climate resiliency of smallholder agroecosystems and their corresponding small businesses must be sustained over time and adaptable to the inevitable changes in climate variability over decades. For smallholders to sustain climate resilient practices and production systems, they must have the ability to continuously invest in climate-resilient agricultural technologies and practices, operations and maintenance of resilient-irrigation infrastructure and efficiency equipment, and acquisition of essential climate-resilient inputs. Smallholders, particularly the poorest farmers, require increasing amount of financial resources and access to credit to build the resiliency of their agroecosystems.
22. With growing rainfall variability and droughts, the risk to farmers and agroecosystem productivity from not investing in climate resiliency increases. The incremental costs to poor/near-poor smallholders of start-up investments in water security and resilient agricultural practices are initially prohibitive. At the same time, if initial investments in climate resiliency of agroecosystems are obtained, they must be sustained, and farmers must be able to cover the additional costs of necessary re-investment in irrigation maintenance and inputs to climate resilient agricultural systems.
23. At the current time, only 25% of poor farmers in both regions have taken out loans to invest in farm inputs through the formal system, with the primary sources of these loans being the Agricultural Bank and the Vietnam Bank for Social Policies. The low number of poor farmers with these loans is primarily due to barriers presented by complex collateral and procedural requirements, the loan size being too high against available smallholder collateral, and the limited repayment capacity of the poor smallholder household.
24. To engender a shift to climate-resilient technologies and practices and sustain investments in operations and maintenance of infrastructure and equipment, farmers need to secure the move towards diversified systems with increased revenues enabled by access to markets. While markets in both regions are fairly well developed, particularly for major crops such as rice, coffee, pepper, cashew and fruits, climate-resilient crops will require information on pricing and market trends, which while existing, is generally inaccessible to poor/near-poor smallholders – particularly women and ethnic minority farmers - thus hindering their ability to adequately manage climate risk. Access to market by poor/near-poor smallholders is impeded by this lack of timely and actionable information on demand, prices, logistics, etc., which can be a key to effectively managing the financial impacts of climate shocks. These farmers lack the skills to successfully navigate the relatively complex marketing systems prevailing in town and cities around the two regions, as well as nationally and for export.

¹⁷ RIMES, CGIAR (2015). State of Climate Information Products and Services for Agriculture and Food Security in Vietnam.

¹⁸ UN Viet Nam (January 2017) (Ibid.), and Nguyen Phuong Le. (2016) (Ibid.) Verified by field consultations.

25. Finally, as climate risks continue to evolve, the burden of financial requirements to continue to cope with water insecurity and adaptation of agricultural systems will increase. Sustaining and scaling up of the adaptation investments to secure water for resilient agricultural systems requires access to credit for the vulnerable smallholders. Obstacles to access to credit by poor/near-poor smallholders, particularly women and ethnic minorities, include lack of awareness and knowledge of risks of adaptation investments both among farmers and financial intermediaries, lack of climate-risk informed planning and management of the agricultural systems that can inform the design of appropriate credit instruments, need for high amounts of collateral, especially in the absence of good understanding of risks. Apart from the need to lower financial risk by overcoming barriers to improved, climate- resilient production skills (see barrier 2, above), improved water security from last-mile connectivity, storage and irrigation efficiency (barrier 1), and more robust technical assistance and information services for climate resilient production (barrier 3), it is also important that financial intermediaries have the knowledge and capacities to assess climate risks and adaptation investments and policies, instruments, and expertise calibrated to enhance access to credit by smallholders to support investment in climate resilient water infrastructure, crop production and marketing.

B.2. Project description

26. The objective of this project is to empower vulnerable smallholders in the Central Highlands and South Central Coast regions of Vietnam – particularly women and ethnic minority farmers - to manage increasing climate risks to agricultural production by securing water availability, adopting climate-resilient, water-efficient agricultural cropping systems, and using climate, agricultural and market information for risk assessment and water and agricultural planning and management. The project directly contributes to GCF impact areas of (1.0) increased resilience and enhanced livelihoods of the most vulnerable people, communities, and regions and (2.0) increased resilience of health and well-being, and food and water security. To achieve its objective, the project will enable poor/near-poor smallholders to adapt to climate-driven rainfall variability and drought through implementation of two linked Outputs using GCF and co-financing resources to overcome the above barriers:

1. Improved access to water for vulnerable smallholder farmers for climate-resilient agricultural production in the face of climate-induced rainfall variability and droughts
2. Strengthened capacities of smallholder farmers to apply climate and market information, technologies, and practices for climate-resilient water and agricultural management

Output 1: Improved access to water for vulnerable smallholder farmers for climate-resilient agricultural production in the face of climate-induced rainfall variability and droughts

27. This Output will overcome barriers to sufficient irrigation water for climate-resilient production through investment in irrigation systems and technologies, including storage and water-efficient equipment. Modernization and expansion of irrigation systems will provide farmers access to water, allowing them to diversify and expand the area of high climate-resilient crops. The full design and implementation of the project proposed here will be closely coordinated with the WEIDAP project, to be financed through an ADB loan to GoV¹⁹ to establish large-scale irrigation infrastructure, bringing water to eight different farming areas across the two target regions. The UNDP project, using GCF resources, will finance the incremental costs of achieving last-mile connectivity for poor/near-poor smallholders by linking their plots to the WEIDAP systems. For rain fed farmers beyond the reach of WEIDAP irrigation connectivity, this project will overcome deficiencies in the storage of water required to cope with climate change-induced rainfall variability and droughts. This Output will, therefore, also provide supplementary irrigation from localized sources, as well as enable farmers to increase efficiency of irrigation through the use of technologies like sprinklers and drip irrigation, where appropriate, in tandem with augmenting the water productivity of diversified cropping systems e.g. intercropping, agroforestry systems, etc. (see Output 2).

Activity 1.1: Establish large-scale irrigation infrastructure to bring irrigation water to eight farming areas across the target regions

28. This activity corresponds to the ADB/GoV-financed *Water Efficiency Improvement in Drought Affected Provinces* (WEIDAP) in Dak Lak, Dak Nong, Binh Thuan, Ninh Thuan and Khanh Hoa provinces, comprising the target area of the project proposed here. The project will be implemented to provide water to eight specific areas in the five provinces and improve agricultural water productivity ('crop per drop') and climate resilience by increasing water use efficiency in irrigated agriculture. WEIDAP has three major outputs as follows:²⁰

- 1) Modernized irrigation management services adopted: irrigation water allocation and delivery, maintenance of irrigation infrastructure, piloting of water delivery charging mechanisms, and policy and institutional arrangements for management, operations and maintenance.

¹⁹ From 2018 to 2022, MARD and provincial PPCs will implement the project 'Water Efficiency Improvement in Drought Affected Provinces' (WEIDAP) in five provinces: Dak Lak, Dak Nong, Binh Thuan, Ninh Thuan and Khanh Hoa. Total WEIDAP budget is \$124.26 million, of which co-financing of 23.21 million.

²⁰ ADB, MARD (April 2017). Water efficiency improvement in drought-affected provinces (WEIDAP), Vietnam (TA 9147-VIE): project preparation consultancy services. Mid Term Report.

- 2) Modernized irrigation systems developed and upgraded: rehabilitation and development of modern irrigation infrastructure
 - 3) On-farm water distribution, application and management practices for high value crops improved: promote adoption of on-farm water efficiency techniques, support the development of high tech agricultural production zones.
29. ADB/GoV financing for WEIDAP output 2, above, constitutes co-financing for the GCF-funded portion of this Output (Activities 1.2-1.4, below). GCF funding will not be applied for the implementation of this activity. WEIDAP provides significant investment to establish functional large-scale irrigation infrastructure in the Central Highlands and South Central Coast regions, including both construction and improvements to management, operations and maintenance. This activity includes investment in rehabilitation of existing irrigation systems and the construction of new systems based on surplus water in existing reservoirs and drainage lines. WEIDAP subprojects can be grouped into three categories (i) main pipeline systems connected to current reservoirs (either pumped or gravity fed), (ii) upgraded canals, and (iii) new weirs to provide pumping ponds from which farmers will extract water suited to their own requirements.

Activity 1.2: Establish last-mile connections to current and planned government irrigation schemes to support smallholders to cope with increasing rainfall variability and droughts

30. This activity will support poor/near-poor farms of less than one hectare to adapt agricultural systems to climate variability by overcoming barriers to last-mile connectivity to the WEIDAP systems, thus enabling them access to sufficient, reliable water during extreme drought. These actions will link to and build directly on government investments supported by the WEIDAP project (Activity 1.1) to build 13 weirs, upgrade canals and build pipeline systems to connect 15 reservoirs in the 37 communes across the five target provinces. GCF resources will cover the costs of meeting the additional demand for water and climate risk management from poor/near-poor farmers not yet connected to WEIDAP. In close coordination with the WEIDAP project, GCF resources will deliver technical expertise to cover the additional costs of incorporating climate risk mitigation into the design and implementation of the connections to WEIDAP and the distribution systems, as well as resources to cover the costs of these connecting systems (pipes, water shifting valves, small water storage and others). Connectivity will be supported through financing contingent on completion of initial equipment training, as well as smallholder contributions of labor in co-designing, installing and maintaining the systems (appropriate monitoring systems will be developed during project preparation). This support is provided only after successful participation in Farmer Field Schools (FFS) (see Activity 2.1, below) and completion of courses on climate-resilient farming (including water efficiency practices) conducted in the village/commune.

Activity 1.3: Enhance supplementary irrigation of rain fed smallholders to cope with rainfall variability and drought

31. This activity will support poor/near-poor smallholders unable to connect to WEIDAP in the 37 communes to cover the corresponding gaps they experience in water availability through construction or enhancement of supplementary water storage systems enabling them to better maintain minimum irrigation water supplies during climate-induced droughts. These systems will also lay the groundwork for any future phased expansion of either the WEIDAP project or other investments as they will facilitate future connectivity investments. This activity will fund - with GCF resources, leveraged local government cash co-financing, and smallholder contributions - small ponds that will either serve individual poor or near-poor households (Binh Thuan) or be shared among groups of households (Dak Nong, Dak Lak, Khanh Hoa) or a village. Mechanisms and criteria for smallholder contributions will be further developed during project preparation. In the case of shared public ponds, no less than 50% of benefitting farmers will be poor and/or near-poor. Ponds and surrounding areas will benefit from expert assistance to design and replicate proven good practice in lower-cost, climate-resilient landscaping measures. These improved climate-resiliency techniques have been proven to enhance available natural water sources (e.g. streams), including groundwater recharge, can significantly reduce evaporation rates, and can increase infrastructure resiliency through well planned use of protection measures such as the planting of locally suitable plants (vetiver grass, bamboo) or pond bed covering, etc. Design options for this infrastructure will be thoroughly analyzed and discussed in the Feasibility Study as part of project preparation. While local government will provide co-financing, GCF resources will be used to cover construction costs; shared facilities will require cash contributions of 30% from local farmers' groups. Mechanisms, procedures and criteria for cash contributions will be developed during project preparation. Farmers will also be required to make in-kind contributions (labor, materials) to the co-design, building and maintenance of the ponds. GCF support will be contingent on participation in a Farmer Field School and successful completion of courses on climate-resilient farming (including water efficiency practices – Activity 1.4) conducted in the village/commune. Operations and maintenance (O&M) of water storage facilities will be the responsibility of the farmer groups or village based on training, protocols and formal agreement of smallholder stakeholders. The project will facilitate expertise to help the community to develop protocols or codes of conduct for O&M, as well as mobilize O&M funds, as needed.

Activity 1.4: Increase smallholder capacities to apply on-farm practices and technologies to maximize water efficiency to cope with rainfall variability and drought

32. To enhance water availability for climate-resilient agriculture, smallholders must adopt practices and technologies that maximize the efficiency of irrigation. This activity will support approximately 19,000 poor/near-poor households in target communes to apply water efficiency technologies and practices. This will include the provision of technical expertise to co-design, climate-resilient, low-cost technologies with poor farmers and train them in their application, as well as in their operation and maintenance. This work will build on ADB-funded research and technical advice on systemic water balance measurement and planning under the WEIDAP project. This activity will support the installation of on-farm water efficiency systems for individual poor/near-poor smallholders via procurement by a third party (e.g. NGO). Farmers will receive this support contingent on (i) farmers' in-kind and cash contributions to the co-design and installation of the system (mechanisms, criteria, procedures to be developed during project preparation); (ii) commitment to maintaining the system, (iii) participation in Farmer Field School training courses on climate-resilient farming (including soil management to enhance moisture-holding capacity, recharge of groundwater, and water productivity) conducted in the village/commune. Government agricultural extensionists will receive training to support farmers in acquiring the skills needed for water efficient farming. This activity will directly complement GoV/ADB investments under the WEIDAP project in water metering technology for target areas, which includes research on improving water management and flow for the target areas done by domestic research institutes and experts. For farmers' groups, where at least 50% of members are currently poor or near-poor, 40% of costs of the technologies will be required to be financed by the farmers themselves (the mechanisms, criteria, procedures will be developed during project preparation). The project will train agricultural extension workers to provide technical expertise to help the farmers' groups with development, facilitation, and assistance in designing, installing, costing and ensuring the establishment of appropriate operation and maintenance systems. This mixed group model will enable the project to extend benefits to an additional 12,000 farming households, will help leverage community ownership for the project, and will also encourage farmer-to-farmer learning.

Output 2: Strengthened capacities of smallholder farmers to apply climate and market information, technologies, and practices for climate-resilient water and agricultural management

33. While in coping with rainfall variability and drought, the activities in Output 1 aim to increase availability of water, as well as improve water use efficiency, Output 2 will enable poor/near-poor farmers to manage climate risk to their agro-ecosystems by applying climate-resilient soil, water and crop planning and management practices to reinforce the investments in water security (Output 1). The Output proposed here will enable poor/near-poor smallholder farmers across the Central Highlands and South Central Coast regions to overcome information, skills and knowledge barriers limiting their abilities to produce climate-resilient crops under rainfall variability and drought. Smallholder farmers will acquire the skills needed to enhance the resiliency and productivity of their agro-ecosystems, as well as to understand how to access credit and markets to ensure vital financial sustainability of the promoted shift to climate-resilient cropping systems. GCF resources will be combined with co-financing to cover the costs associated with this Output. Through Farmer Field Schools implemented at scale across the two regions, this Output will facilitate widespread adoption/application by vulnerable smallholders of climate-resilient agricultural practices and technologies²¹. Smallholders will build on traditional knowledge and modern science to adapt their cropping systems to climate-resiliency requirements originating in localized analyses of rainfall variability, extreme weather events and agro-ecosystem vulnerability. Farmers will be trained in resilience-enhancing crop diversification, as a climate-risk reduction strategy, and soil management to build resilience to climate variability by enhancing soil fertility and biodiversity, improving soil structure, and limiting soil erosion. Increasing the quality and accessibility of climate information will enable smallholders to use a key climate risk management tool to enhance climate-resilient farming systems in the Central Highlands and South Central Coast regions, as well as elsewhere in Vietnam. With systematic reception and interpretation of this information, smallholders will be able to buffer the impacts of increased climate change-induced droughts and floods. As climate change increasingly challenges traditional local knowledge of key farming cycles (by shifting, for example, optimal crop planting dates) or increases the likelihood of unseasonable rain or droughts, farmers are increasingly in need of access to actionable weather and climate information that can help them cope with these changes. To ensure that smallholders are able to sustain post project climate resiliency of their agro-ecosystems under conditions of evolving climate variability, the project will build the capacities of smallholders to access credit for investments in climate-resilient agricultural technologies and practices, operations and maintenance of irrigation infrastructure and efficiency equipment, and acquisition of essential climate-resilient inputs for crop production. At the same time, the project will work with lenders to streamline protocols and procedures, as well as to develop and apply appropriate instruments for lending to poor/near-poor smallholder farmers for their adaptation investments. For farmers to successfully market their climate-resilient production, information on prices, demand, buyers and other factors will be indispensable.

Activity 2.1: Scale up climate-resilient practices (soil, crop, land management) among smallholders through farmer-field schools

²¹ A comprehensive implementation and monitoring framework will be developed during project preparation as part of the Feasibility Study.

34. This activity will focus on empowering farmers with the skills and capacities, as well as continual access to information, to enable them to make informed choices regarding options to increase the resilience of their farms and income streams. Through Farmer Field Schools, farmer champions from the different villages in the target regions will analyze agroecosystem vulnerability using traditional knowledge and scientific information, evaluate and confirm appropriate climate risk mitigation measures, and learn methods and practices of managing soil, water and crop genetic resources to ensure ongoing, iterative adaptation to continuing climate change. Post FFS, these farmers will upscale this approach across the two regions by returning to their communities and training neighboring farmers with support from government and NGOs. Analysis and identification of climate-resilient practices and technologies to be adopted and upscaled will be carried out as part of project preparation; likely areas to be explored include shifting to more resilient crops or crop varieties, intercropping and crop diversification, and iterative methods for improvement of water and soil management based on local conditions and climate projections. By utilizing existing farmer extension services but strengthening their outreach, materials and farmer-to-farmer learning opportunities, the project will reach approximately 180,000 small farmer households, at least 50% of whom will be poor/near-poor farmers. Agricultural extension agents will receive training to assist farmers in carrying out agro-ecosystem vulnerability assessments.

Key sub-activities include:

- In partnership with local government and farmers' organizations, and using climate information and traditional knowledge, analyzing agro-ecosystem vulnerability to climate variability in each commune, assessing ecological and socio-economic factors and conditions contrasted with localized climate information and projected climate change. Based on this analysis, review/confirm potential agro-ecosystem management practices and diversification of crop portfolios to maximize both climate resiliency and productivity.
- Developing climate risk management guidelines for smallholders, NGOs and government agencies for more resilient crops and cropping systems, farm landscape design, intercropping techniques, integrated farming systems, water and soil management practices, sloping agricultural land technology, and/or agroforestry to better integrate methods able to build resilience to rainfall variability and drought associated with climate change projections. This will involve increasing access by farmers to climate change projection data analysis, currently seldom available at sub-national level (see Activity 2.3, below).
- Enhancing existing training materials to include climate change risk assessment and evaluation of potential resilience/productivity-enhancing measures, and making them more accessible to local farmers, potentially involving both innovative SMS/web-based materials but also accessibility in local languages, including tailored products that are gender-sensitive and appropriate to local conditions and education levels (see Activity 2.3, below).
- Carrying out Training of Trainers for both MARD and DARD personnel, as well as other interested parties (NGOs, Farmers and Women's Unions, etc.) to build a cadre of farmer champions to galvanize adoption and application of climate-resilient cropping and land management practices at scale in the villages and communes across the target area.
- Training by farmer champions of multiple neighboring farmers in each village and commune (the target numbers for each champion farmer will be determined during project preparation).
- Continually disseminating information and knowledge to farmers for application through Farmer Field Schools and self-organized farmer groups led by farmer champions trained as trainers for peer-to-peer learning and learning by doing.

Activity 2.2 Generate and disseminate localized climate and market information (integrated agricultural advisories) for use by smallholders to enhance climate-resilient agricultural production

35. This activity will focus on developing and conveying climate and market information in the form of agricultural advisories tailored to local conditions and educational levels. Data gathering will be localized/adapted to local conditions. Investments in improved outreach systems will enhance farmer access to climate and market information from a variety of sources that can increase the climate resiliency and productivity of their farms, including information on market prices, on new buyers for their products, or on climate-resilient agricultural or water management practices, input prices, etc. Through this activity, the project will improve the access of 332,260 women, ethnic minority and other poor/near-poor farmers in target areas to climate and market information to support agricultural production.

Key sub-activities include:

- *Establishing low-cost weather stations and crop data analysis systems to support generation of localized climate and weather information.* The project will scale up a proven public-private partnership model (please see the Pre-feasibility Study pages 43-51 for brief descriptions of experiences with these partnerships) to support the installation of low-cost real-time weather stations/ crop data monitoring in different micro climate zones at district level. GCF will co-fund establishment of these systems to be maintained jointly by local farmers' groups and a

specialized private sector partner.²² This will include installation of stations; software to transmit data automatically to farmer-friendly and ready-to-use format on mobile phone/computer (simple graphs, etc.); and guidelines for farmer groups on operation and maintenance. Day-to-day maintenance will be the responsibility of local communities and/or farmer groups depending on local conditions with support by private sector partners.

- *Co-developing seasonal and 10-day/15-day agro-climate and market advisories with smallholder farmers.* The project will support co-development of advisories by multi-stakeholder platforms comprising farmer champions of each commune, together with the Centre for Hydro-Meteorological Forecasting, DARD, traders and other entities. These platforms will meet and discuss agricultural, climate and market information, trends and patterns at pre-season, post-season and 10-day/15-day periods. The platforms will use data and information provided by the network of weather stations, farmer champions, and other sources to develop and package easily accessible agro-climate advisories. Market information will be accessed from a variety of existing sources²³ such as SMS-based systems by NGOs, private sector and government projects and packaged to accompany the agro-climate advisories. Agro-climate, weather and market advisories will be developed for all 14 districts in the project, and will enhance models that can support further replication at low cost.
- *Disseminating advisories to farmers.* Advisories produced by the multi-stakeholder platforms will be disseminated through traditional local administrative systems via written notifications, loudspeakers, TV and radio; through farmer champions from each platform disseminating to neighboring farmers in their commune/village; and through a partnership with a private sector operator to communicate via SMS and mobile phone applications. Where appropriate, translation to ethnic minority languages will also be supported. To enhance replication, the project will ensure that local government officials are also trained in the system, and will encourage information sharing by the government in other districts to promote potential replication through government systems.

Activity 2.3 Technical assistance for smallholders and lenders to enable access to credit and markets for sustained investments in resilient water and agricultural systems

36. Through leveraged GoV co-financing, this activity will invest in building capacities of smallholder farmers and lenders to facilitate adaptation investments in building the resiliency of household agricultural production. This activity will support smallholder farmers with the skills and information they need to plan and manage their agricultural production as a small business, including learning to access markets for climate-resilient farm products in order to generate the revenue required to sustain climate resiliency of their agroecosystems. At the same time, smallholders will learn how to manage financial resources, particularly credit, to permit them to purchase inputs, cover the costs of operations and maintenance of irrigation equipment and improve crop, soil and water management to enhance productivity and climate resiliency of their agroecosystems. Farmers will attend Farmer Field Schools to learn the skills necessary for business planning, including analysis of market information, cost calculations, estimations of profit and loss, and investment planning. Farmers will learn operations and maintenance of key farm assets, as well as financial management to capitalize O&M funds and ensure financing is available for farm business operations. The project will work with established lenders (e.g. Agricultural Bank, Bank for Social Policies) to develop protocols and financial instruments specific to the conditions and capacities of poor/near-poor farmers who, having received technical training, are expected to invest over time in climate-resilient technologies and inputs. The project will train lending institution staff in analysis and development of small-scale business plans for diversified, climate-resilient production. Smallholders will learn how to potentially manage credit as they reduce their risk of default through implementation of climate-resilient water management and agricultural production practices, good financial management and improved market access. Agricultural extension workers will be trained to support farmer champions during and after their FFS experience, especially to ensure and support peer-to-peer extension to be practiced by farmer champions. To help poor/near-poor farmers who desire to diversify towards an improved, more climate resilient crop system but cannot afford to do so, the project will build on existing proven good practice to provide an initial voucher system to support seed and input purchase (seedling, organic fertilizer, etc.) for the first three years of the project. Interested poor/near-poor farmers, who have successfully completed training courses and have developed a simple improved business management plan for their farms, will be eligible to receive vouchers for inputs redeemable at selected local providers with a proven track-record of successfully providing quality inputs to farms in the area. This method will enhance and galvanize local markets and enable the poor/near-poor to build the financial foundations of more resilient farming systems before the voucher system is phased out in year four of the project. Voucher systems have been successfully utilized by IFAD, FAO and SNV to jump-start agricultural improvement programs and the best practices to be implemented in this project are derived from experience with these systems. Options for voucher systems and other performance-based systems will be analyzed during project preparation.

B.3. Expected project results aligned with the GCF investment criteria

²² For example, since 2015, the Vietnamese enterprise AgriMedia is offering SMS-based weather and market information services to farmers, agricultural enterprises, reservoir operators and agricultural planners through its iMetos system.

²³ For example, Viettel, AgriMedia through Vinaphone, VnSAT project by WB, Green Coffee project by the NGO ICCO

37. **Impact potential:** As a result of this project, over 21,296 poor/near-poor farmers will have obtained direct access to water for irrigated agricultural production, reducing the impact of climate change-related rainfall variability and drought. 181,055 small-scale farmers (with farms of less than one hectare) will have the capacity to apply efficient and climate-resilient water and agricultural practices to cope with rainfall variability and drought. Overall, 332,260 small-scale farmers will directly benefit from access to and the skills to use climate and market information for resilient agricultural production. Indirect beneficiaries include 301,205 households in the target districts and nearby districts who, though not participating directly in the project, will receive agro-climate information and market advisories and improve their skills through their association and interaction with farmer champions and strengthened agencies and institutions, as well as through improved access to market and credit. Indirect beneficiaries of the project will also include agricultural extension workers and staff of the Farmers' and Women's Unions. Increasing access of poor/near-poor farmers to last-mile access to irrigation and/or improved water storage options enables them to better apply climate resilient technology and information. It also empowers them to replicate climate resilient agriculture practices currently available only to larger, more industrial farms.
38. **Paradigm shift:** The Theory of Change for the project is provided in Annex I. A paradigm shift in addressing adaptation needs among smallholder farmers in the Central Highlands and South Central Coast regions lies in implementing an integrated, primarily bottom-up approach to empowering vulnerable smallholders – especially women and ethnic minority farmers – with the knowledge and resources they need to manage climate risks to water availability and agricultural production. The adaptation solution proposed here focuses on two mutually reinforcing elements of this approach: (i) access to sufficient water for agricultural production including through large-scale and supplementary irrigation and (ii) climate-resilient cropping systems that use water efficiently on irrigated and rain fed lands. For smallholders in the Central Highlands and South Central Coast regions to build and sustain the resilience of their agroecosystems in the face of increasing rainfall variability and drought, they will need to access sufficient water for crop production through irrigation, where possible, and through improved soil and water management on rain fed lands; and smallholders will need to be able to plan and manage cropping systems that make efficient use of water. However, to enable climate-risk informed planning and management for resilient agricultural production in light of water insecurity, the smallholders need access to climate information and agricultural advisories so they can apply mitigation options that will enhance both resilience and productivity of their agro-ecosystems. With access to climate information, including weather forecasting, and training, smallholders can understand climate risks to their agroecosystems, identify and implement mitigating crop, soil and water management measures, and carry out climate-informed planning and decision-making to sustain climate-resilient agricultural production over time. Access to markets and credit is fundamental to sustain transformational changes towards climate-resilient production systems over the years, enabling farmers to develop micro-small farm enterprises and then re-invest the ensuing profits in inputs to maintain the climate-resilience of their agro-ecosystems. An important element of this paradigm shift is the potential for increased climate adaptation benefits through broad scale replication expedited by integration of this project's GCF-funded activities with the WEIDAP project. Climate risk management training and climate and market information will be readily available to benefit farmers involved in WEIDAP. The project leverages co-financing to complement WEIDAP's large-scale infrastructure investments with last-mile access for smallholders and builds their technical and financial capacities to build and maintain market-oriented, climate-resilient agricultural systems. This, in turn, paves the way for future expansion of water and agricultural sector investments in the five provinces grounded in the improved capacities of these vulnerable farmers. While this project provides training, information, institutional support, and initial grant assistance to help smallholders overcome barriers to adaptation, it also provides training and technical assistance to smallholders and linkages with local banks to access finance for longer term sustainability and enables access to markets to generate the revenues to pay back their loans. Localized agro-climate and market information, including weather forecasting, and its application as actionable advisories, will allow smallholders to manage climate risk sustainably and carry out effective planning and decision-making for resilient agricultural production.
39. The potential for replication at scale is high given the possibilities for expansion of the WEIDAP irrigation system, the lessons learned from this project and institutional capacities for project management. At the same time, on the demand side, the potential for replication is enhanced by stakeholder incentives such as increased and more stable yields and more diversified sources of income, resulting from the successful practice of climate-resilient agriculture on irrigated and rain fed land. Project lessons and best practice may be adapted to similar socio-economic and ecological conditions elsewhere in the country. The proposed project also creates pathways to scale through the establishment of FFS, strengthened capacities of extension services, improved climate information, and private sector engagement (including for access to credit and climate and market information). Market access enabled by this project will provide ongoing incentives to smallholders for climate-resilient production and marketing in coordination with other private sector and government actors.
40. **Sustainable development:** This project will contribute to increased climate-resilient sustainable development in Vietnam by strengthening the adaptive capacity and reducing the exposure of small-scale farmers - most of whom are women - to climate risks in the Central Highlands and South-Central Coast regions. Ethnic minorities

will also benefit from improved adaptive capacities and reduced exposure. The government is investing in irrigation and water schemes to support diversified climate-appropriate cash crop production. Such investments are critical as, according to recent climate change scenarios, by 2050, yields from key self-sufficiency crops will be declining, with expected decreases of 16% for maize, 2.6% for cassava and 6.6% for rice. This project will implement cost-effective ways of scaling up and replicating policy priorities that currently suffer from weak field-based implementation systems. At the same time, by taking an integrated approach the project will provide evidence for development of future policy directions in line with Vietnam's commitments under the Paris Agreement. Focusing on some of the highest risk provinces - both in terms of poverty rates and climate risk - this project will support GoV to increase effectiveness of planned government investments in irrigation and water supply by specifically increasing the access of the poorest households to these systems. Interventions are explicitly designed to contribute to a paradigm shift that will enable women and poor/near-poor farmers, including ethnic minority farmers, to benefit from proven advances in climate resilient agriculture in Vietnam. Improving poor farmers' and especially ethnic minority and women farmers' access to climate information and the skills needed to act on that information can have a transformative impact on their livelihoods, currently eroding from the impacts of increasing climate variability on rain-fed agriculture. Ensuring that climate products are tailored to specific audiences, including those with less formal education or limited Vietnamese language skills (as for ethnic minorities), can remove a key barrier to empowering a highly sensitive group. Linking these outputs to improvements in market access for a more diversified basket of crops, further buffers the poorest households when climate extremes occur.

41. The project will produce a number of significant environmental benefits. Smallholder farmers will diversify their production as a climate risk management measure, including through agroforestry systems, integrated crop-animal systems and other forms of mixed cropping, which will improve soil cover, strengthen nutrient cycling, enhance rainfall infiltration and improve aquifer recharge. Diversified cropping systems also produce ancillary benefits in regard to the prevalence and diversity of insect populations, including pollinators. With irrigation, soil can remain covered longer, thereby avoiding soil loss from wind erosion or from abrupt massive soil loss due to extreme rainfall events. As a consequence of adopting more climate-resilient agricultural practices, soil organic matter will increase, resulting in greater water holding capacity, increased carbon storage and improved soil biodiversity.
42. **Needs of Recipients:** For both target regions, climate change is expected to severely impact agricultural productivity, primarily through reduced water availability resulting from rainfall variability and extreme droughts. The most vulnerable population is comprised of smallholder farmers growing one or two rain-fed crops on upland farms with a second particularly vulnerable group comprising smallholders cultivating one or two crops in lowlands but with limited access to irrigation and dependent on streams or wells. For both of these groups, there is a strong positive correlation between vulnerability, poverty, ethnic minority and gender inequality, so their prioritization is required. As stated in the GoV-UNDP *Viet Nam Special Report on Managing the Risks of Extreme Weather Events and Disasters to Advance Climate Change Adaptation*, inequalities influence local coping and adaptive capacity, and pose disaster risk management and climate change adaptation challenges from the local to the national level. Socio-economic inequalities and differences in access to livelihoods or land, and other factors determine vulnerabilities of households and communities in Viet Nam.²⁴ A World Bank study identifies the main social vulnerabilities for both regions. For the Central Highlands, these include high numbers of ethnic minorities, migrants, and farmers depending on rain-fed and subsistence agriculture as well as high rates of poverty. For the South Central Coast, social vulnerability is largely determined by high poverty, particularly among ethnic minority groups, and a dependency on rain-fed agriculture in many areas.²⁵ The GoV's key laws, strategies and action plans on climate change and disaster risk reduction also recognize the socio-economic groups most vulnerable to climate change impacts: pregnant and nursing women, children, the poor, elderly, people with disabilities, and ethnic minorities, especially in upland areas. GoV statistics confirm the higher than average vulnerabilities of these groups in the target provinces.
43. **Need for Strengthening Institutions and Implementation Capacity:** The impacts of climate variability on the targeted provinces are aggravated by insufficient institutional capacities for extension of climate-resiliency knowledge and technical skills, and provincial and local authorities are thus unable to fully support poor/near-poor smallholders in adapting to climate variability. National budget allocations to the relevant Ministries and other institutions responsible for climate change adaptation coordination, disaster risk management, climate/weather, agricultural and market information services, and water management and irrigation development are inadequate given the emerging and projected costs of meeting climate change adaptation needs. As a result, while upgrading of their technical and implementation capacities to meet the challenges of climate change is required, resources have been insufficient to meet this need. This project will build the

²⁴ GoV's Institute of Meteorology, Hydrology and Climate Change, United National Development Program (January 2015). Viet Nam Special Report on Managing the Risks of Extreme Weather Events and Disasters to Advance Climate Change Adaptation

²⁵ Pamela McElwee (December 2010). The Social Dimensions of Adaptation to Climate Change in Vietnam. World Bank Discussion Paper Number 17.

capacities of MARD and other institutions to provide agro-climate and market information to smallholder entrepreneurs and train trainers in climate-resilient water management and agricultural practices and systems and subsequently train farmers across the five target provinces.

44. **Country Ownership:** The proposed project is aligned with current Vietnamese Government policies and programmes to foster adaptive capacity and climate resilience including: Vietnam's priority actions under its Nationally Determined Contribution to Paris Agreement 2015; Action Plan Framework for Climate Change Adaptation and Mitigation in the agriculture and rural development sector for the period 2008-2020; Action Plan on Response to Climate Change in the agriculture and rural development sector period 2011 - 2015 and vision to 2050 (MAPCC); Directive on Integrating Climate Change into the development, and implementation of strategies, planning, plans, programs, and projects of the agriculture and rural development sector, period 2011-2015; Program of GHG emissions reduction in the agriculture and rural development sector by 2020; MARD's Plans to implement the National Action Plan on climate change period 2012 – 2020 and visioning 2030; and the MARD Agricultural Restructuring Plan; Green Growth Action Plan in Agriculture and Rural Development to 2020 focusing on promoting water efficiency use and improve sustainable farming techniques; the *Agricultural Restructuring Program* focusing on shifting to more sustainable and climate-resilient crops and practices; the *Irrigation Law* (which was issued in June 2017) which aims to modernize government investments in irrigation, and creates a framework for the implementation water pricing, PPP in irrigation and promoting water efficiency technology.
45. **Efficiency/effectiveness:** A detailed economic analysis will be presented in the full proposal. The anticipated stability and increase in production from farmers' irrigated small plots during droughts and dry spells will be analysed and documented during the Feasibility Study, as will the corresponding effects of crop diversification. The resulting production of a surplus will allow smallholders to generate the revenue needed to purchase essential goods and services to enhance and maintain the climate resiliency and productivity of their agroecosystems beyond the project's lifetime. It is expected that increased production of climate-resilient crops will provide greater opportunities for hired farm labor. This project will be implemented in five provinces complementing and building on WEIDAP investments in irrigation systems. This integration with the WEIDAP project will ensure efficiency and effectiveness of implementation given common implementation arrangements, which will result in more pronounced and sustainable impacts. The integrated approach proposed by this project will ensure that project outputs are mutually reinforcing with improved water access and agro-climate and market information supporting climate-resilient agricultural production, whose surplus will provide the financial resources to maintain and enhance climate-resiliency of agroecosystems beyond project duration. This project will improve farmers' soil, water and crop management skills from participation in Farmer Field Schools, training of trainers, and wider dissemination of agro-climate and market advisories, which will improve the efficiency of irrigation and water productivity in the face of ongoing climate variability.

Indicative financing / Cost information

C.1. Financing by components

Outputs/Activities	Indicative cost (USD)	GCF financing		Co-financing		
		Amount (USD)	Financial Instrument	Amount (USD)	Financial Instrument	Name of Institutions
Output 1: Improved access to water for vulnerable smallholder farmers for climate-resilient agricultural production in the face of climate-induced rainfall variability and droughts						
Activity 1.1: WEIDAP irrigation systems	118,770,000	---	---	118,770,000	Loan	GoV/ADB
Activity 1.2: Last-mile connectivity to WEIDAP	4,159,269	3,709,269	Grant	450,000	Provincial fiscal	Local authority/ Farmers
Activity 1.3: Supplementary irrigation and water storage	2,654,100	2,124,220	Grant	529,880	Provincial fiscal	Local authority/ Farmers
Activity 1.4: Low cost water-efficient practices/technologies	31,206,250	16,968,250	Grant	14,238,000	Provincial fiscal	Local authority/ Farmers
Output 2: Strengthened capacities of smallholder farmers to apply climate and market information, technologies, and practices for climate-resilient water and agricultural management						
Activity 2.1: Capacities to enhance climate-resiliency of agroecosystems	3,250,000	2,925,000	Grant	325,000	Provincial fiscal	Local authority

Activity 2.2: <i>Climate, agricultural, market information to enhance climate-resilient production/access to markets for climate-resilient crops</i>	3,126,000	2,813,400	Grant	312,600	In-kind Finance	Local authority
Activity 2.3 <i>Sustain resiliency of agriculture by enabling access to credit and markets</i>	1,343,264	1,208,938	Grant	134,326	In-kind Finance	Local authority
Indicative total cost (USD)	164,508,883	29,749,077		134,759,806		

C.2. Justification of GCF funding request

46. Vietnam is experiencing a crucial financing gap to cover the incremental costs of adapting to climate change. According to Vietnam's NDC, the national budget can only meet one-third of the financing required to implement adaptation measures in the 2021–2030 period. Between 2017 and 2020, the government estimates that financing climate change adaptation activities will cost approximately US\$4.7 billion annually. External funding support to meet the incremental costs of managing climate change risks and impacts is therefore critical, particularly in high priority sectors such as agriculture, where the majority of poor people are employed.
47. Between 2012-2016, Vietnam's debt burden increased significantly as a percentage of GDP. In an effort to support long-term macro-economic stability, the Government has now imposed far stricter loan guidelines and limits. Loans will now only be approved for large infrastructure projects, many of which have been in the pipeline for years. New projects, or those that focus on softer investments, must be funded through grants or local tax revenues. While Government is continuing to invest in baseline infrastructure required to bring water for irrigation to the affected areas, fiscal constraints impede investments in additional costs of ensuring water security in light of the changing climate. For poor and near-poor smallholders in the two regions, investment in connectivity, storage and efficient irrigation equipment is limited given their weak financial capacities further undermined by climate change
48. As such, this project - designed in close partnership with the Asian Development Bank – provides GCF incremental finance in the form of grant resources to deliver direct resilience benefits to vulnerable poor/near-poor smallholders, increasing the effectiveness of the larger GoV/ADB WEIDAP loan investment, particularly in regard to benefits for women, the poor/near-poor and ethnic minorities. In some cases, even if they fall within the catchment area of a larger irrigation investment programme, they may not be able to benefit as they lack the resources to fund the last-mile connection to their farm. Through the paradigm-shifting approach of combining investments in water supply, resilient agricultural production, and access to actionable agro-climate and market information, the project will enhance smallholder communities' productive and social assets to tolerate immediate rainfall variability and droughts as well as build their capacities to invest in sustained maintenance of investments and continued climate-risk management over the longer term. GCF resources play a critical role in leveraging both loan and fiscal resources for further infrastructure development and investments in irrigation, agriculture and climate information.

C.3. Sustainability and replicability of the project (exit strategy)

49. This project has strong governmental endorsement as it builds on the Vietnamese governments long held policy of support to farmers' groups with extension and technical assistance, infrastructure development, credit, inputs and other goods and services. Long-term sustainability of the project is a fundamental part of project design. The experiences and lessons learned from this project will facilitate adaptation of the project's outputs and activities to other existing/planned government irrigation investments in the coming years. A foundation of this project is that local level investments are community-based, demand-driven, and co-designed and implemented. Poor/near-poor smallholders will contribute their labor, as well as materials and potentially cash, to the construction and maintenance of irrigation equipment and the relatively modest infrastructural elements connecting their farms to the government's existing and planned large-scale irrigation investments. Last-mile connections and on-farm systems will be maintained by the farmers themselves through established farmers' groups who will be trained in system and equipment operations and maintenance through the project. The selection of technologies to be applied ensures that maintenance requirements will be relatively low, and that spare parts can be sourced locally at reasonable cost. Finally, farmers' groups will build their organizational capacities to program and manage irrigation, monitor usage, and develop and capitalize O&M funds for community-held equipment and infrastructure.
50. Smallholder application of climate-resilient production practices and systems will be sustained by first analysing traditional agro-ecosystems and co-identifying adjustments to ensure their productivity and climate resiliency, training smallholders in the technical aspects of climate-resilient agriculture, and building the capacities of the MARD extension services to continue to guide farmers over time. Agricultural inputs, soil and water management improvements, and O&M of irrigation systems and equipment all require continuous financing so that smallholders can enhance or maintain the climate-resiliency of their agro-ecosystems as climate variability inevitably evolves; as such, this project will train smallholders to access credit and use market information to develop business plans for their small-scale production systems and access markets for their crops. The project will work with lending institutions to develop protocols and financial instruments specific to the conditions and

capacities of poor/near-poor farmers, as well as train their staff in analysis and development of small-scale business plans. Farmers will receive training in financial and business management. Investments in agro-climate, weather and market advisory information systems will be sustained by public and private sector partners. The participatory approach to weather forecasting and advisory development will involve local communities and link them to public institutions charged with compiling data for use in generating advisories. Farmer champions will receive training to interpret and disseminate weather forecast information to their own networks. For the private sector, by project end, there is potential to develop the SMS-based climate/weather information and advisories and market information into a paid service, a portion of whose revenue will be shared with farmer groups for operation and maintenance and to the local authority for conducting participatory discussions. This potential will be explored and finalized further during full proposal development.

C.4 Engagement among the NDA, AE, and/or other relevant stakeholders in the country

51. This project responds to an initial written request from Ministry of Agriculture and Rural Development (MARD) to UNDP to work with ADB to develop stronger coordinated support to build the resilience of farmers in areas covered by the WEIDAP project. UNDP worked closely with CPO (WEIDAP PMU) and ADB to analyze field conditions, consult locally and prepare the Concept Note. The Concept Note was shared with ADB and CPO to ensure complementarity of the two projects. Multi-stakeholder consultations are on-going in the design of the project and have included consultations with senior government, key multi-lateral and UN partners, including Asian Development Bank, and project provinces. UNDP is also actively consulting with NGO networks, including the Climate Change Working Group, and has initiated dialogue with key mass organisations in Vietnam, including the Vietnam Women's Union and other stakeholders to ensure effective engagement in design and participation in implementation. During preparation of this Concept Note, 14 consultations were done with NGOs and international donors, two with private sector entities, 15 with DARDs, districts and communes, and 10 with farmer groups in Dak Lak, Dak Nong, Binh Thuan, Ninh Thuan and Khanh Hoa, to collect information on vulnerability to climate change; priorities and needs; current projects and programs on climate change adaptation; poverty reduction; ethnic minorities' support; sustainable agriculture development; and gaps and recommendations. Most of the key partners and donors have expressed interest in cooperating with UNDP to develop this project proposal and to mainstream and upscale their initiatives to fill in the current gaps. Finally, the International Cooperation Department of MARD organized a meeting of MARD departments to discuss the Concept Note, and MARD expressed its full support for the project.

Supporting documents submitted

- Maps indicating the locations of the project (Annex I)
- Diagram of the theory of change (Annex II)
- Financial Model
- Pre-feasibility Study (Annex III)
- Evaluation Report of previous project

Self-awareness check boxes

- Are you aware that the full Funding Proposal and Annexes will require these documents? Yes No
- Feasibility Study
 - Environmental and social impact assessment or environmental and social management framework
 - Stakeholder consultations at national and project level implementation including with indigenous people if relevant
 - Gender assessment and action plan
 - Operations and maintenance plan if relevant
 - Loan or grant operation manual as appropriate
 - Co-financing commitment letters

Are you aware that a funding proposal from an accredited entity without a signed AMA will be reviewed but not sent to the Board for consideration? Yes No