ADAPTATION FUND

SINGLE COUNTRY/ REGIONAL INNOVATION PROJECT/PROGRAMME PROPOSAL

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme:	Innovative adaptation financing to build the resilience and adaptive capacity of smallholder farmers in Bhutan (InAF-Bhutan)
Country:	Bhutan
Thematic Focal Area[1]:	Innovative adaptation financing
Type of Implementing Entity:	Multilateral implementing entity
Implementing Entity:	World Food Programme
Executing Entities:	Ministry of Agriculture and Forests
Amount of Financing Requested:	USD 4,978,034

A. Project Background and Context

Summary of problem statement and proposed solution

With altitudes ranging from 100 metres in the foothills to over 7,500 meters in the north, the fragile mountainous ecosystems of Bhutan render the country extremely vulnerable to the impacts of climate change[2]; it is already highly prone to a range of hydrometeorological hazards, including glacial lake outburst floods (GLOFs), flash floods, riverine floods, landslides, landslide dam outburst floods, cloudbursts, windstorms, droughts and river erosion.[3] Smallholder farmers who rely mainly on rain-fed agriculture are already affected by unpredictability in the timing of monsoons, and localised water shortages and prolonged drought in some areas.[4] At the same time, farmers, especially women who predominate in the agricultural sector, lack a credible risk transfer mechanism such as affordable crop insurance that could prevent them from resorting to negative coping strategies, and have insufficient access to the climate-resilient agricultural approaches, technologies and finance that they could harness to enhance the resilience of their agriculture-based livelihoods and address the climate impacts already experienced, and prepare for the future climate risks.

To address this problem statement, the project will roll out the primary innovation in the Bhutanese context of micro index insurance for smallholder farmers, predominantly women, in an integrated and iterative fashion that harnesses multiple perspectives on innovation and encourages the integration of secondary innovations identified at the community level. For insecure farmers who are exposed to recurrent shocks and who under-invest to minimize their risks, microinsurance offers the opportunity to manage their climate-related shocks and encourages them to invest in their plots so that they can make their livelihoods more climate resilient. Through an integrated risk management approach, the risk transfer mechanism of insurance will be layered with risk reduction activities (in the form of enhanced natural resource management and climate resilient agricultural technologies), as well as increased access to savings to help households cope with smaller, more frequent shocks (sustainable risk absorption). In this way, vulnerable smallholder farmers will be supported to generate increased production and obtain more income from their farming activities in a risk informed manner. By also supporting improved access to markets for climate-resilient produce to enable livelihoods diversification, and access to microfinance, farmers will be able to make further investments in developing

[1] Thematic areas are: Agriculture, Coastal Zone Management, Disaster risk reduction, Food security, Forests, Human health, Innovative climate finance , Marine and Fisheries, Nature-based solutions and ecosystem based adaptation, Protection and enhancement of cultural heritage, Social innovation, Rural development, Urban adaptation, Water management, Wildfire Management.
[2] National Environment Commission (2020) Third National Communication to the UNFCC.
[3] RGoB and World Bank (2015) Modernizing Weather, Water and Climate Services: A Road Map for Bhutan.
[4] RGoB and World Bank (2015) Modernizing Weather, Water and Climate Services: A Road Map for Bhutan.

climate resilient livelihoods (prudent risk taking). This implementation strategy will result in increased household food security and income and will contribute to the post COVID-19 revitalization and transformation of agriculture in Bhutan.

Location and climate

Situated on the southern slope of the Eastern Himalayas, Bhutan is a small, landlocked country with an area of 38,394 km^2. [5] It extends approximately 170 km north-to-south and 300 km east-to-west, bordering China to the north and India to the south, east and west. The vast differences in altitude, the influence of the North Indian monsoons, and the location at the northern periphery of the tropical circulation result in three distinctive climatic zones: (i) Subtropical southern belt (altitude of 200 – 2,000 metres) with high humidity and heavy annual rainfall (around 1,500 mm), and a temperature range of between 15°C to 30°C all year round; (ii) Temperate central belt (2,000 to 4,000 metres) consisting of main river valleys, characterized by moderate rainfall (about 1,000 mm per annum) with cool winters and hot summers; in the monsoon season from June to September (JJAS) temperatures are between 15°C and 26°C, with the winter range between -4°C to 15°C; and (iii) Alpine region in the north with snow-capped peaks and alpine meadows above 4,000 metres, which has cold winters and cool summers, and about 40 mm of annual precipitation, mostly in the form of snow.[6] The three climatic zones encompass numerous micro-climates due to dramatic variations in elevation and topography.[7] About 70 percent of the country's rain falls during the summer monsoon (JJAS), and 20 percent in the pre-monsoon season.

Environmental and agro-ecological conditions

Bhutan's varied topography results in a rich natural heritage: it is one of the world's top 10 biodiversity hotspots, has one of the most extensive protected area systems (51 percent of total area), and comprises 70.77 percent forest cover.[8] Thanks to the proactive environmental conservation approach, many of the high-biodiversity value habitats such as primary forests, high altitude wetlands, and home ranges of flagship species fall within the protected area system. The area under glaciers was approximately 1.6 percent of the land cover in 2018[9], while 2.6 percent of the land is used for agriculture.[10] Bhutan is rich in agricultural biodiversity, with more than 100 species of agricultural crops; 384 landraces of rice, 105 of maize, 36 of wheat, 10 of sweet buck wheat, 11 of bitter buckwheat, 32 of barley, 22 of amaranth and 36 of millets; and around 230 species of Crop Wild Relatives (CWR).[11]

Direct pressures on biodiversity include land use conversion, forest fires, over-extraction of timber and fuel wood, overgrazing, forest offences and wildlife poaching, unsustainable agricultural practices, pollution, invasive species, and human-wildlife conflict; climate change acts as a risk multiplier, increasing the incidence of pests and diseases, invasive species, and forest fires; and aggravating the loss of species, agro-biodiversity, and traditional knowledge and practices ("biocultural" loss). [12] The country's limited land resources are threatened by different types of land degradation: water induced degradation (gully, landslides and ravine formation), wind and cultivation erosion, and in-situ degradation such as depletion of soil organic matter, nutrient mining, topsoil capping and subsoil compaction.[13] Causes of land degradation overlap with drivers of biodiversity loss, and include forest fires, excessive use of forest resources, overgrazing, unsustainable agricultural practices, poor irrigation management system, infrastructure development without proper environmental measures, mining, industrial development and urbanization.[14]

Socio-Economic Characteristics and Vulnerabilities

Population, economy and poverty

Bhutan has a population of 748,931, with 52.19 percent male and 47.81 percent female in 2020; 60 percent of the population is below the age of 25 years[15]. The country is still largely rural, with only 37.8 percent of the population residing in urban areas in 2017[16]. Bhutan is administratively divided into 20 dzongkhags, which consist of 205 gewogs ("blocks"), four larger towns ("thromdes"), 18 dzongkhag towns and 42 satellite towns.

[5] National Environment Commission (2020) Third National Communication to the UNFCC.
[6] National Environment Commission (2020) Third National Communication to the UNFCC.
[7] NCHM (2019) Analysis of Historical Climate and Climate Projection for Bhutan. National Centre for Hydrology and Meteorology, RGoB.
[8] National Environment Commission (2020) Third National Communication to the UNFCC.
[9] The status and decadal change of glaciers in Bhutan from the 1980s to 2010 based on satellite data. http://www.icimod.org/?q=13008
[10] RGoB, Bhutan's 21st Century Economic Roadmap. Sector: Agriculture, Food Security and Nutrition, and Biotechnology.
[11] National Environment Commission (2016) Fifth National Report to the UNCBD.
[12] National Environment Commission (2016) Fifth National Report to the UNCBD.
[13] Dorji, T et al (undated) Land Degradation in Bhutan – An Overview. https://www.nssc.gov.bt/wp-content/uploads/2021/04/land-degradation.pdf
[14] RGoB (2014) National Action Plan to Combat Land Degradation. Submitted to the UNCCD.
[15] Bhutan at a Glance 2020, National Statistics Bureau
[16] Population Projections Bhutan 2017-2047. Bhutan's urban population will be 56.8 percent by 2047.

Bhutan's economic development policy is guided by the overarching philosophy of Gross National Happiness (GNH), based on the four pillars of sustainable economic development; preservation and promotion of culture and tradition; conservation of the environment; and good governance. Bhutan recorded a growth of 5.46 percent in 2019, taking its GDP per capita to USD 3,411.94 from USD 3,331.40 in 2018.[17] However, economic growth is forecast to contract by 3.4 percent during the fiscal year (FY) 2021 from 0.9 percent in FY 2020 due to stringent COVID-19 pandemic containment measures, including two prolonged nationwide lockdowns that immensely slowed economic activity across sectors.[18] Currently the world's only carbon-neutral country, Bhutan aims to mitigate growing emissions from economic development by pursuing low emission development pathways across all sectors;[19] in 2015 the country recorded net negative emissions of 5.6 million tons of CO2.[20]

Hydropower, construction, transport, storage and communications, and agriculture are the main economic drivers, while tourism contributes more than 9 percent to GDP and earns the highest foreign currency reserves. The climate-sensitive primary sector, comprising agriculture, livestock and forestry, contributed 0.14 percentage points to GDP growth in 2019, which was a drop by 2.95 percentage points from 4.25 percent in 2018, due to reduced performance of the crop sector and decreased growth of the forestry sector.[21] Agriculture absorbs the highest workforce with 49.9 percent of the total employed persons followed by the service sector with 36.6 percent[22]. However, agricultural workers earn on average a tenth of what is earned by service sector workers.[23] More women than men are farmers – approximately 61.7 percent against 41.7 percent of men – a growing trend referred to as the 'feminisation of agriculture' in Bhutan.[24] In addition to climate impacts experienced, some of the major challenges in farming, especially in the eastern parts of the country, are (i) human-wildlife conflict (HWC), (ii) steep slopes and unfertile land; (iii) water shortages and inadequate irrigation infrastructure; and (iv) pests and diseases.[25] Agriculture and food items account for 17 percent of the country's total import expenditures, with over 90 percent of food imports coming from India. Despite considerable agricultural constraints, Bhutan's varied agro-ecological zones allow for a wide variety of produce to be grown and there are significant opportunities to increase the impact of the agri-food sector.[26] Bhutan's unemployment rate of 5 percent (6 percent for females and 4.1 percent for males) is the highest to date, with urban unemployment (10.1 percent) four-times higher than that of rural areas (2.7 percent); youth unemployment is estimated at 22.6 percent or 6,922 persons, of whom about 38.7 percent are males and 61.3 percent are females.[27] Thus a preeminent challenge is youth unemployment and the social issues associated with this.[28]

Bhutan has steadily reduced its poverty rate, from 31.7 percent in 2003 to 8.2 percent in 2017 (using a poverty line of Nu. 2,195.95 or USD 33 per person per month at average 2017 exchange rate).[29] Poverty in rural areas (11.9 percent) is significantly higher than in urban areas (0.8 percent).[30] Amongst the employed, poverty rates are higher in households whose heads are working in the agriculture sector. Bhutan's moderate rural poverty rate of 11.9 percent marks substantial disparity across the 20 dzongkhags (districts), with the headcount ratio in 2017, i.e., the proportion of people living below the national poverty line, ranging from merely 0.4 percent in Paro to 38.6 percent in Dagana. Moreover, while poverty as measured by both the headcount ratio and the number of the poor is more concentrated in the south and southeast regions of the country, neighbouring dzongkhags in the same region might have significantly different poverty conditions, highlighting the need for disaggregated poverty mapping to target interventions effectively.[31]

The majority (99.5 percent) of the population has access to an improved water source with hardly any disparity between poor and non-poor households, while at least 92 percent of households have access to improved sanitation; between poor and non-poor households, both in urban and rural areas, the disparity is around 8 percent.[32] Among non-poor households, 67 percent have at least one smart phone, compared to only 29 percent among poor households; however, ordinary phone ownership among poor households (80.5 percent)

[17] National Accounts Statistics 2020
[18] https://www.adb.org/news/bhutan-economy-shrink-2021-expected-rebound-2022-adb
[19] RGoB (2020) National Climate Change Policy.
[20] RGoB (2021) Kingdom of Bhutan Second Nationally Determined Contribution submitted to the UNFCCC.
[21] National Accounts Statistics 2020, National Statistics Bureau
[22] 2020 Labour Force Survey Report, National Statistics Bureau
[23] Nu 67 per hour, compared to Nu 604 per hour earned by a worker in the service sector. Source: Annual Report 2020, Royal Monetary Authority
[24] As noted in MoAF 2021, RNR Strategy 2040, Policy and Planning Division, Ministry of Agriculture and Forests, Thimphu, Bhutan
[25] College of Natural Resources, personal communication, 17 June 2022.
[26] MoAF (2021) Food Systems for Gross National Happiness: transformative pathways for Bhutan.
[27] Bhutan Labour Force Survey 2020.
[28] RGoB, Bhutan's 21st Century Economic Roadmap, Executive Summary.
[29] https://www.nsb.gov.bt/publications/poverty-analysis-report/
[30] Ibid.
[31] NSB Bhutan (2019) Small Area Estimation of Poverty in Bhutan: Poverty Mapping Report 2017.
[32] Bhutan Poverty Analysis Report, 2017.

is significantly higher than non-poor households (54.3 percent).[33] Nationally, only 39 percent of poor households have television, compared to 76 percent of non-poor households.

Gender and development

The Constitution of the Kingdom of Bhutan, 2008, provides an overarching framework to ensure gender equality. While women in Bhutan enjoy relative gender equality with men, influences from socio-cultural perceptions at times hold women as more vulnerable than men.[34] Although women's status is relatively high in Bhutanese society, there is an ongoing perception that women and men have specific roles to play; women being viewed as 'homemaker, wife, and mother' has limited their access and opportunities, whilst confining them to household and agricultural activities where productivity and earnings are relatively low. Men's participation in regular paid employment is, therefore, higher at 36.5 percent against 19.3 percent for women. Bhutanese women predominate among unpaid family workers and workers with low earnings, and thus bear a disproportionate responsibility for domestic unpaid care work that largely goes unrecognized. A recent study on violence against women in Bhutan revealed that one in three ever-partnered women aged 15–64 years had experienced one or other forms of domestic violence in the last 12 months, and 44.5 percent in their lifetime.[35] The same study cast light on the extent to which domestic violence was condoned by Bhutanese women, who often accept abuse as their plight or their 'karma' whilst the culture of silence prevents them from accessing available public services. This situation is compounded by the economic dependence of many women on their husbands.

Bhutan ranks 130 out of 156 countries in the Global Gender Gap report, having closed 63.9 percent of the gender gap, using indicators of economic participation and opportunity, educational attainment, health and survival and political empowerment to assess the extent of gender parity.[36] The importance of gender mainstreaming across policies, plans, programmes and projects has increased recently in Bhutan. While about 60 percent of rural women hold land registration titles, which is higher than anywhere else in South Asia, areas in which women are at a disadvantage compared to men are politics and decision-making, tertiary education and economy, with rural women being more vulnerable.[37] Women's urban literacy rate of 63.9 percent is lower than that for men (78.1 percent),[38] which translates into lower levels of female participation in formal employment and high public office.

Effects of the Covid-19 pandemic

In addition to the adverse impact of Covid 19 on economic growth, inflation was expected to rise from 3 percent in FY 2020 to 6.4 percent in FY 2021, due to supply chain disruption and panic buying, but forecast to ease to 5.3 percent in FY 2022, as prices were expected to trend lower in India and as domestic conditions improved.[39] Food prices increased by approximately 15 percent in 2021, which poses a risk to food and nutrition security and the livelihoods of vulnerable people, particularly as the country still imports about 50 percent of the total food consumed.[40] The dependency on food imports led to major food insecurity in the country as COVID-19 lockdown restrictions disrupted international supply chains, especially affecting fresh produce distribution. The Economic Contingency Plan developed by the RGoB in response to the pandemic prioritised the need to increase national food self-sufficiency, as already prescribed in the 12th Five-year Plan (2018-2023) and other policies. Tourism has been the worst hit sector, as it was closed to foreign tourists leading to loss of jobs: in 2020 up to 30,000 people had to seek work or migrate back to their villages.[41] The COVID-19 pandemic and recurrent lockdowns have increased unpaid work especially for women and girls, strongly reinforcing social and cultural norms where women and girls are expected to do unpaid household chores.

Health, nutrition and food security

Bhutan has made significant improvements in reproductive, maternal, new-born and child health (RMNCH) and almost all households have access to improved drinking water and sanitation facilities.[42] Child malnutrition requires further attention as one-fifth of children were stunted in 2015; of these, 1 in 3 were

[33] Bhutan Poverty Analysis Report, 2017.
[34] https://www.ncwc.gov.bt/notifications/324
[35] NCWC (2017). National Survey on Women's Health and Life Experiences: A study on Violence against Women and Girls in Bhutan. National Commission for Women and Children, Royal Government of Bhutan, Thimphu.
[36] Global gender Gap Report 2021
[37] National Environment Commission (2020) Third National Communication to the UNFCC.
[38] PHCB 2017, quoted in NEC (2020): TNC to the UNFCCC.
[39] https://www.adb.org/news/bhutan-economy-shrink-2021-expected-rebound-2022-adb
[40] https://kuenselonline.com/economic-impact-of-covid-19-worsening-the-malnutrition-status-in-asia-and-pacific-un/
[41] RGOB, 2020. Rapid Socio-Economic Impact Assessment of COVID-19 on Bhutan's Tourism Sector: An analysis of the vulnerability of individuals, households, and businesses engaged in the tourism sector. National Statistics Bureau and UNDP: Thimpu.
[42] Ministry of Health Bhutan. Annual Health Bulletin 2021.

severely stunted and 4 in 10 were anaemic.[43] Overall, 7 percent of girls and boys are underweight, while 35 percent of children aged 6-59 months and 44 percent of women of reproductive age are either anaemic or iron deficient. Malaria is on track to being eliminated by 2022, while other climate-related diseases such as dengue and chikungunya have emerged over the last few years and indicate a growing trend.[44] Bhutan has been lauded for its efficient COVID-19 pandemic preparedness and response efforts, which kept caseloads far lower than elsewhere in the region.

Although 98 percent of households in Bhutan are food secure, 88 percent of children aged between 6 to 23 months do not have a minimum acceptable diet. This indicates that food security is not enough for achieving nutritional status[45]. In 2019, Bhutan produced only 49,948.05 Metric Ton of irrigated and upland rice, one of its main staple foods,[46] and imported 84,584 MT in the same year - an increase by 18 percent from 2018[47].[48] The high dependency on imported food has had a knock-on effect on food consumption patterns in Bhutan and is contributing to already high levels of stunting and anaemia in many rural areas.[49]

Climate Change Vulnerabilities, Impacts and Risks

Climate trends and projections

Observed trends

While Bhutan's lack of long-term temperature and rainfall data[50] limits the detection of accurate trends, validated proxy data[51] from 1976 to 2005 show a mean annual temperature increase of 0.8 degrees Celsius, with the highest increase during the winter season (1.3°C), and a decreasing trend in rainfall at mean annual scales with high variability.[52] Daily minimum temperatures are increasing at a greater pace than daily maximum temperatures.[53] The southern areas are prone to dry-spells and drought induced by the variability of monsoon rainfall.[54] Over recent years, more frequent extreme weather events, including hailstorms and heavy rainfall, have been observed and precipitation patterns have altered. Increased temperatures have accelerated the shrinkage of glaciers, leading to more rapidly forming glacier lakes that are increasingly hazardous.[55]

Projected changes

Simulated projections for South Asia and for Bhutan show increasing temperature and precipitation in both winter and summer with large anomalies during the monsoon season.[56] The increase in temperature under an intermediate global emissions scenario or Representative Concentration Pathway (RCP) 4.5 is projected to be about 0.8°C– 2.8°C during 2021-2100, while projections under a high global emissions scenario of RCP 8.5 show increases of between 0.8°C to more than 3.2°C towards the end of the century. Greater warming is indicated during March-April-May (MAM) and December-January-February (DJF) seasons, and a larger increase is projected in higher altitudes.[57]

The mean annual rainfall over Bhutan is likely to increase in the future under both RCPs: under RCP 4.5, an increase of 10 percent to 30 percent is projected, with a 5-15 percent increase in summer rainfall (JJAS). While a likely increase of rainfall during the winter (DJF) is also projected, some parts in the north and northwest could experience a decrease in rainfall. Under RCP 8.5, an increase of above 30 percent is projected for the whole of Bhutan by 2100. However, the north-west is expected to experience decreased winter rainfall (DJF). All emissions pathways project an increase in the precipitation associated with a maximum 5-day rainfall event across Bhutan, with heaviest rainfall occurring in the southeast of the country.[58]

Climate models project a significant increase in the likelihood of heatwaves and droughts, which are likely to impact more severely on communities in Bhutan's lowlands. By the 2090s, the median probability of a heat

[43] Ministry of Health Bhutan. National Nutrition Survey. (2015).
[44] National Environment Commission (2020) Third National Communication to the UNFCC
[45] UN Family 'scaling up' on nutrition (unicef.org)
[46] http://www.moaf.gov.bt/agriculture-statistics-2019-online/#
[47] https://kuenselonline.com/import-of-rice-increase-by-18-percent/
[48] Rice and cooking oil are among the top ten commodities imported by Bhutan, rice contributing 2.42 percent share and cooking oil contributing 1.24 percent share.
[49] Bhutan Country Nutrition Profile, 2018
[50] The observed data sets, of which most are in the middle and southern parts of the country, have only been available since 1996.
[51] From the Climatic Research Unit (CRU), University of East Anglia, UK.
[52] NCHM (2019) Analysis of Historical Climate and Climate Projection for Bhutan. National Centre for Hydrology & Meteorology, RGoB.
[53] Climate Risk Country Profile: Bhutan (2021): The World Bank Group and the Asian Development Bank.
[54] NCHM (2019) Analysis of Historical Climate and Climate Projection for Bhutan. National Centre for Hydrology & Meteorology, RGoB.
[55] NCHM (2019) Science seminar on 'Climate change-induced risks and vulnerabilities of Glacial Lake Outburst Floods'.
[56] Chhogyel, N., and Kumar, L. (2018) Climate change and potential impacts on agriculture in Bhutan: a discussion of pertinent issues. *Agric & Food Secur* **7,** 79 (2018). https://doi.org/10.1186/s40066-018-0229-6
[57] National Environment Commission (2020) Third National Communication to the UNFCC.
[58] Climate Risk Country Profile: Bhutan (2021): The World Bank Group and the Asian Development Bank.

wave [59] in Bhutan is projected to increase dramatically from the current probability of 2 percent to approximately 20 percent under RCP 4.5, and as high as 36 percent under RCP 8.5.[60] Higher temperatures are projected to also contribute to increased snowmelt which could change patterns of river discharge and water availability, with potential impacts on infrastructure growing significantly in the second half of the 21st century.[61] Cold waves are also projected to increase under climate change.[62]

Current and future vulnerabilities, risks and impacts of climate change

As a mountainous country within the Hindu-Kush Himalayas (HKH), Bhutan is highly prone to a range of hydrometeorological hazards, including GLOFs, flash floods, riverine floods, landslides, landslide dam outburst floods, cloudbursts, windstorms, and river erosion. Across most of the HKH including Bhutan, glaciers have thinned, retreated, receded, and lost mass since the 1970s, increasing the risk of GLOFs[63]. With climate change, the frequency and intensity of extreme events are expected to increase.[64] The country already ranks fourth highest in South Asia in terms of relative exposure to flood risks, with 1.7 percent of the total population at risk. Most of the infrastructure, fertile agricultural land, and over 70 percent of settlements are located along the main drainage basins and are therefore at high risk of flooding and landslides, especially during the monsoon season. In the mid-mountains, landslides triggered by cloudbursts are frequent, and recent occurrences of landslide dam bursts have caused major destruction in low-lying areas, including the Thimphu Valley. Bhutan is also at risk for tropical cyclones. Flash floods are a recurrent phenomenon, with the eastern and southern regions being the most vulnerable.[65] The country's economy is predominantly dependent on the climate-sensitive sectors of agriculture and hydropower; and the mountainous landscape makes communication and transport fragile and expensive.[66]

Table 1: Impacts of climate-related extreme weather events in Bhutan

Extreme weather events	Year	Remarks
Glacial lake outburst (GLOF) flash flood	1994	Damaged 965 acre of agricultural land
Rice blast epidemic	1996	80-90% crop loss in high altitudes
High-intensity monsoon rain, nationwide	2004	Damaged 39 irrigation channels
Northern corn blight	2007	>50% crop loss in high altitudes
Unusual windstorm	2008	Damaged maize crops of 320 hhs in Eastern Bhutan
Cyclone Aila/flash flood	2009	>100 acre land washed away
Flash flood and landslides	2010	Affected 809 acre of land, damaged irrigation channels
Hailstorm in Punakha	2012	30–40% rice crop damaged
High-intensity rain/windstorm	2013	>100 acre maize crop damaged, erosion and damaged irrigation structures
Hailstorm/flash flood	2015	>100 acre rice crop damaged
High-intensity rain	2016	>100 acre rice crop damaged

Source: Chhogyel and Kumar, 2018 (Adapted from IPCC and NEC)

Climate variability and change threaten to reduce productivity and performance of key socio- economic sectors such as agriculture, hydropower, and tourism.[67] Changes in precipitation patterns are impacting the availability of water for drinking and energy production in the short, medium and long-term, with cycles of flooding during monsoons and very low flows and drying streams during other seasons. Extreme weather events expose infrastructure assets (such as hydropower and road network) to increased risk of floods and landslides.

Agriculture is particularly vulnerable to current and projected climate change, with associated risks to rural livelihoods and food security, as more than 60 percent of the rural population depend upon it for their livelihoods. Women are more vulnerable to climate change impacts than men due to their substantial engagement (at 61.7 percent against 41.7 percent for men) in agriculture, compounded further by the increasing feminization of agriculture sector. Moreover, climate change impacts are more pronounced for Bhutanese women due to the existing discriminatory patriarchal laws, norms, customs and institutions.[68]

[59] Defined as a period of 3 or more days where the daily temperature is above the long-term 95th percentile of daily mean temperature.
[60] Climate Risk Country Profile: Bhutan (2021): The World Bank Group and the Asian Development Bank.
[61] Climate Risk Country Profile: Bhutan (2021): The World Bank Group and the Asian Development Bank.
[62] National Environment Commission (2020) Third National Communication to the UNFCC.
[63] ICIMOD (2019) *Summary of Hindu-Kush Himalaya Assessment Report.*
[64] RGoB and World Bank (2015) Modernizing Weather, Water and Climate Services: A Road Map for Bhutan.
[65] RGoB and World Bank (2015) Modernizing Weather, Water and Climate Services: A Road Map for Bhutan.
[66] National Environment Commission (2020) Third National Communication to the UNFCC.
[67] NCHM (2019) Analysis of Historical Climate and Climate Projection for Bhutan. National Centre for Hydrology & Meteorology, RGoB.
[68] Yeshey, K. (2022) Gender Assessment Report for the Bhutan AF Larges Innovation Grant project. Report submitted to WFP Bhutan.

Monsoon seasons with high rainfall, flash floods and landslides have damaged existing irrigation schemes and disrupted market access for many smallholders. These impacts have a major bearing on the RGoB's goals of food self-sufficiency and inclusive green socio-economic development, due to the impacts on smallholder farms. Apart from a few areas of open valley, agricultural land is generally located along steep geographic terrain, with more than 31 percent of agricultural land located on slopes greater than 50 percent resulting in soil losses of 8.6 tons/ha from traditional farming practices that are not resilient to increased runoff during the monsoon season, particularly after long dry periods.[69] Heavy rainfall experienced between October 16-21, 2021 caused extensive damage to harvested paddy in the fields, as well as to national highways and farm roads, mainly in the western and central Dzongkhags.[70] It affected more than 2,500 acres in 17 rice growing districts (including Paro, Samtse, Punakha, Wangdue, and Dagana).[71] In addition to this recent example of the adverse effects of climate change on farmers and agricultural production,[72] increased intensity and duration of dry periods is already occurring, and will become more serious – for example, rice yield in the southern subtropical regions is expected to be adversely affected by heat waves, drought and changing patterns of precipitation.[73]

Farmers increasingly report unstable crop yields, production losses, declining crop quality, and decreased water availability for farming and irrigation.[74] These impacts will be worsened by the projected increases in temperature and in intensity of heavy rainfall events, as well as reduced water availability. Pests and diseases, some of which are related to changing weather and climate, are a significant challenge for rural smallholders. An example is army worm infestation of numerous crops important for household food security, including maize and rice. Without effective adaptation, the impact of climate change on both global food security and local production is likely to increase hunger and malnourishment in Bhutan.[75]

Bhutan is expected to experience a wide range of climate-related health risks. Rising temperature and unpredictable weather patterns will affect water supply to communities and influence the epidemiological pattern of vector-borne, airborne, and water-borne diseases.[76] The impact of flooding on human health and livelihoods is expected to grow and could be 4 percent of GDP by the 2030s.[77] Emergency medical health requirements will also rise with climate-induced disasters such as GLOFs, floods and landslides. The health impacts of projected increases in both heat and cold waves have not yet been studied in any detail but are likely to be severe in the absence of effective adaptation.[78]

Multi-dimensional vulnerability and barriers to adaptation

Multi-dimensional vulnerability

The socio-economic and climatic vulnerabilities discussed above constitute a context of multi-dimensional vulnerability to climate change, operating at different levels. Multidimensional vulnerability as expressed on the Notre Dame Global Adaptation (ND-GAIN) Index[79] is depicted in Figure 1.

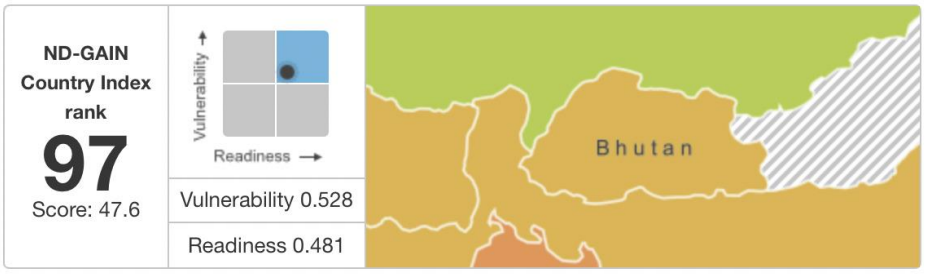

Figure 1 ND-GAIN index ranking for Bhutan

The high vulnerability score and high readiness score of Bhutan places it in the upper-right quadrant of the ND-GAIN Matrix. This score indicates that while Bhutan is on the road to responding effectively to climate

[69] UNDP (2019) Annex IV of the GCF proposal for the project 'Supporting Climate Resilience and Transformational Change in the Agriculture Sector in Bhutan'.
[70] Department of Disaster Management (2021) Initial Damage Assessment Report on the Recent Heavy Rainfall (October 17-19, 2021).
[71] The numbers in the original source (DMC, 2021) have been corrected through a personal communication from the Department of Agriculture, 20 July 2022.
[72] *Initial Damage Assessment report*. Department of Disaster Management, MoHCA, RGoB, 2021.
[73] Chhogyel, N., and Kumar, L. (2018) Climate change and potential impacts on agriculture in Bhutan: a discussion of pertinent issues. *Agric & Food Secur* **7,** 79 (2018). https://doi.org/10.1186/s40066-018-0229-6
[74] NCHM (2019) Analysis of Historical Climate and Climate Projection for Bhutan. National Centre for Hydrology & Meteorology, RGoB.
[75] Climate Risk Country Profile: Bhutan (2021): The World Bank Group and the Asian Development Bank.
[76] National Environment Commission (2020) Third National Communication to the UNFCC.
[77] Climate Risk Country Profile: Bhutan (2021): The World Bank Group and the Asian Development Bank.
[78] National Environment Commission (2020) Third National Communication to the UNFCC.
[79] The ND-GAIN Country Index uses two decades of data across 45 indicators to rank 181 countries annually based upon their vulnerability and their readiness to successfully adapt.

change, the adaptation needs and urgency to act are greater. Particularly vulnerable areas under this index are assessed to be agricultural capacity, and projected change of flood hazard. The relatively high readiness score relates largely to high scores for good governance, masking the low scores on this index for social readiness, education and innovation.[80] All of these factors are critical for enhancing the resilience of smallholder farmers. Bhutan is ranked as the 32nd most vulnerable country and the 60th most ready country, out of 181 countries.

Gender and vulnerability to climate change

Women experience the effects of climate change differently to men and they respond and adapt to climate change impacts differently. As measures to alleviate climate change impacts, men are more inclined to 'look for alternative employment' and 'migrate to city'; leaving women to carry out men's work in addition to their already substantial workloads. On the other hand, women struggle more than men in finding alternative livelihoods, entering formal employment sector, or migrating due to cultural barriers and lack of economic opportunities and education. Thus, women reported alternatives, including; 'change in consumption patterns', 'changing farming practices', and 'taking children out of school'. Bhutanese women (rural women in particular) are therefore more susceptible and vulnerable than men to the climate change impacts. Domestic violence is more prevalent in rural areas and affects women's economic activities as well as their quality of life[81]; this also reduces their adaptive capacity and increases their vulnerability to climate change.

Barriers to adaptation

The specific socio-economic and cultural factors influencing gender and vulnerability to climate change in Bhutan, as summarised above, constitute barriers to women farmers' adaptation to climate change. In addition, the National Adaptation Plan (NAP) process has identified the following overall barriers to adaptation In Bhutan: access to sufficient finance; coordination, learning and awareness; technical capacity for climate information; systematic identification and appraisal of adaptation options; and monitoring and evaluation.[82] The Gender Assessment, secondary literature review, and stakeholder and community consultations have highlighted the following more specific barriers affecting smallholder farmers in Bhutan:

General barriers to enhancing climate resilient agricultural livelihoods in Bhutan: Significant challenges faced by smallholder farmers, both women and men, in addition to changing weather patterns and extreme weather events are labour shortages, lack of market opportunities and infrastructure, and lack of inputs and/or untimely supply of inputs by commissioning agents. High levels of post-harvest losses (PHL) in the project localities have dramatically reduced household economies, with farmers having to sell or consume many of their perishable products within weeks. These challenges have led to the 'empty households' syndrome observed in Bhutan's rural areas. Market linkages are a critical issue to address, including for organic production so that this can deliver the potential increased incomes for vulnerable smallholder farmers.

Access to climate-resilient agricultural approaches and technologies: Despite programmes implemented and trainings conducted in many parts of the country to increase knowledge of and ability to use climate-resilient agricultural approaches and technologies, stakeholders reported that the understanding of this was shallow in most parts of the country. While in practice a higher proportion of women are engaged in agriculture in Bhutan, access to climate resilient agricultural technologies, information, trainings and agricultural inputs are more limited for rural women in Bhutan, for a range of reasons – including the lack of gender-sensitivity of many interventions.[83] This differs from region to region in the country, with women participation reportedly higher in the western and eastern parts of the country, while it is lower in the southern districts.[84] Farmers are often reluctant to use pesticides for religious or spiritual reasons – for example, with a recent army worm infestation of maize in Mongar dzongkhag, farmers reportedly did not want to use available pesticides as the whole month was auspicious *Saga Dawa*.[85] While this may be a barrier with respect to conventional agriculture, these beliefs may help to predispose farmers towards adoption of organic production practices, if provided with ongoing support and effective inputs. To date there has been insufficient development and dissemination of improved organic fertilisers and biopesticides.

Access to rural finance to invest in climate resilient livelihoods: This is in general insufficient for the needs of Bhutan's smallholder farmers, and particularly so for women. Despite Financial Institutions equal and non-preferential treatment, and government's concerted efforts to advance financial inclusion such as priority

[80] https://gain-new.crc.nd.edu/country/bhutan accessed 23 September 2021.
[81] Bhutan Gender Equality Diagnostic of Selected Sectors (ADB, 2014)
[82] http://www.nec.gov.bt/projects/details/preparation-of-a-national-adaptation-plan-nap-for-bhutan-with-a-focus-on-the-water-sector-2019-2023 last accessed 10/06/22.
[83] Yeshey, K. (2022) Gender Assessment Report for the Bhutan AF Larges Innovation Grant project. Report submitted to WFP Bhutan.
[84] RENEW MFI, personal communication provided at the Validation Workshop for the CN of the proposed Bhutan AF LIG, Thimphu, 20 July 2022.
[85] https://kuenselonline.com/armyworm-and-drought-damage-maize-crops-in-mongar/ last accessed 03/07/22.

sector lending, limited access to finance is one of the many constraints faced by rural women. This limited access could be attributed to lack or limited resources for collateral, limited decision-making power and position, complex loan procedures, and loans not suitable to their needs. Although there are numerous savings and credit schemes, they are mostly commercially-oriented and entrepreneurship focused, with insufficient support to subsistence farmers to help them become more commercial. There are insufficient rural-women-targeted schemes that are focused on enhancing the adaptability and resilience to climate change of smallholder farmers. Although indemnity insurance for crops is available, this is mainly oriented towards the more commercial farmers, and relies on time-consuming and resource-intensive inspection of damages for each household insured.

B. Project Objectives

The project's **main goal** is to enhance the resilience of smallholder farmers in Bhutan to key identified climate risks and enhance their food security by rolling out innovative index-based microinsurance through an integrated resilience building approach.

The project will achieve its goal through the following *three* **objectives**:

1. Strengthen climate-resilient agricultural practices to underpin integrated climate risk management by smallholder farmers;
2. Roll out innovative climate risk transfer mechanism and build smallholder farmers' resilience through integrated approach; and
3. Institutionalise innovative climate risk management for long-term sustainability.

The project will meet these objectives through three interlinked components as detailed in Part II.A that will deliver an integrated package of interventions to address key causes of vulnerability to climate change and food insecurity for vulnerable smallholder farmers in selected dzongkhags in Bhutan.

Project area and target groups

The target group for the concrete adaptation activities to be implemented under the proposed Large Innovation Grant (LIG) in Bhutan is climate-vulnerable smallholder farmers in up to six districts or dzongkhags, with an emphasis on women, youth and most vulnerable groups – such as female-headed rural households. Until recently, there has been no systematic district-level climate risk vulnerability assessment; while this is needed, it will be challenging due to the limited observational data, the varied and mountainous topography, and the relatively small size of the country, which influences the reliability of downscaling from global climate models. In general, the entirety of the agricultural production areas are highly vulnerable to increased runoff resulting from more intense rainfall, which is already being experienced across the country, together with increased drought risk in some areas. Studies carried out for various project proposals and annual agricultural statistics point to a heightened level of vulnerability to differentiated climate risks affecting agricultural production and rural livelihoods – for example, the eastern and southern regions are the most vulnerable to flash flooding, while in the mid-mountain areas, landslides related to intense rainfall are a primary threat. While all parts of the country are reportedly experiencing increased dry periods related to rainfall variability, rice yield in the southern subtropical regions is expected to be adversely affected by heat waves, drought and changing patterns of precipitation.[86]

Given the above factors, the project team has selected six preliminary dzongkhags to be considered for inclusion in the proposed LIG project, based on the following criteria:

i. vulnerability to climate risks, as assessed by the RGoB;
ii. poverty levels; and
iii. agricultural potential, including for climate-resilient and sustainable agriculture and commodity landscape-based organic production.

The six preliminary dzongkhags are Paro, Punakha, Dagana, Tsirang, Lhuentse, and Trashigang. Paro and Punakha are located in the west of the country, and Dagana in the south; these dzongkhags are predominantly within the temperate zone, although part of Dagana lies within the sub-tropical southern belt. Lhuentse and Trashigang are located in the east of the country, which has received relatively reduced investment in agricultural development and experiences heightened drought risk. Tsirang lies in the central part of the country and has been selected for preliminary consideration based not only upon the climate risks and vulnerabilities experienced, but also because of its potential for large-scale conversion to organic

[86] Chhogyel, N. and Kumar, L. (2018) Climate change and potential impacts on agriculture in Bhutan: a discussion of pertinent issues. Agric & Food Secur 7, 79 (2018). https://doi.org/10.1186/s40066-018-0229-6

agriculture.[87] Three of the six dzongkhags were selected for community consultations to develop this CN, as these provided a range of livelihood systems and were feasible in the context of COVID-19 restrictions: Paro, Punakha, and Dagana. A summary of the findings of the community consultations can be found in **Part II.J**.

There is good alignment between the preliminary set of dzongkhags identified and the criteria included in the 'Climate change and vulnerability analysis' (CCVA) mapping carried out for the development of the National Adaptation Plan (NAP) process in Bhutan, which includes a dzongkhag-level vulnerability mapping against various criteria, including climate variability, hazards, and various socio-economic parameters. For example, Dagana and Lhuentse are among the top four dzongkhags with over 80 percent of females involved in agriculture, while that for Tsirang is over 70 percent. Dagana and Trashigang, together with Samtse, have the highest sensitivity to climate change arising out of their livelihood and economic situation, with out-migration being the highest in Trashigang (nearly 11.67 percent in 2017). Tsirang and Dagana score low in terms of presence of adaptation strategies such as irrigation, improved farm machinery and social capital, while Trashigang has a medium score in this regard. Dagana and Tsirang are also ranked very low in terms of adaptive capacity, while Trashigang scores low and Lhuentse scores medium in terms of adaptive capacity. In terms of overall vulnerability, Dagana is ranked the second most vulnerable dzongkhag, while Tsirang is the fourth most vulnerable.[88]

Final decisions for the districts to be included in the project, which could be fewer than six due to the need to avoid fragmentation of resources, will be based on the above criteria, as well as additional climate risk, socio-economic, political and environmental variables, including gender, education and nutritional indicators; and the presence of the necessary pre-conditions for large-scale roll-out of index-based microinsurance. The latter include access to existing microfinance channels, production of selected crops at a sufficient volume for the necessary aggregation, value chain development and marketing activities, and the presence of suitable distribution channels for the insurance. A further criterion will be the ability to leverage off the activities of existing and planned projects, in order to promote efficiencies and synergies across investments. As agreed during a multi-stakeholder workshop held in Thimphu on 15 June 2022, it would promote efficiencies and enhance effectiveness to build on the recently approved Building Resilient Commercial Smallholder Agriculture (BRECSA) project in the central and southern districts of Zhemgang, Trongsa, Tsirang, and Sarpang. The full set of criteria to identify project dzongkhags will be developed in a participatory fashion during full proposal development and a robust identification process will be conducted and documented.

The primary project beneficiaries will be poor smallholder farmers with high levels of vulnerability to current and projected climate risks. The project will target more women than men, in recognition of the feminization of agriculture in Bhutan, and the differentiated needs and increased vulnerabilities of rural women. Thus the project will aim to **target 70 percent women**, which exceeds the gender assessment recommendation of 60 percent, and will especially focus on female-headed households that are more food insecure. The exact percentage of women as opposed to men to target will be determined based on actual numbers of female farmers in the final selected dzongkhags. The project will include a focus on rural youth living in areas with high levels of climate risk and low employment opportunities. The exact beneficiary numbers will be determined during full proposal development; however, it is anticipated that the project would include **10,000 direct beneficiary households**, which equates to **40,000 direct beneficiaries** at an average rural household size of four, who would receive the integrated support package of index-based microinsurance and associated activities. At least 7,000 of the direct beneficiary households would be female-headed. The project will empower at least **30 women and youth climate champions**, of whom at least 21 will be female, to serve as advocates for further uptake and scaling out of index insurance and integrated resilience building. In addition, the project would have a further estimated **47,000** indirect beneficiaries who would benefit from enhanced climate services and access to microfinance in the project dzongkhags. The project could potentially benefit the entire rural population of Bhutan through activities to institutionalise the approach to microinsurance for smallholder farmers.

C. Project Components and Financing

[87] This potential was confirmed by a personal communication with the Head of Programmes, National Centre for Organic Agriculture, 16 June 2022.
[88] Climate change and vulnerability analysis mapping for formulation of the NAP process in Bhutan. Draft dated, July 2021, prepared by pwc for UNDP.

Project Components	Expected Outcomes	Expected Outputs	Countries	Amount (USD)
1. Strengthened climate-resilient agricultural practices to underpin integrated climate risk management by smallholder farmers	1.1 Strengthened access to last mile climate services and increased understanding of smallholder farmers on index insurance benefits	Output 1.1.1. Linkages facilitated with existing climate services and support to gender-responsive digitalised dissemination Output 1.1.2. Sensitisation of targeted smallholder farmers on the benefits of index-based microinsurance Output 1.1.3 Leverage ongoing local adaptation planning to assist smallholder farmers to plan their adaptation responses	Bhutan	900,000
	1.2 Strengthened capacities for climate-resilient agricultural support and incentives for sustainable resilience building	Output 1.2.1. Carry out stocktaking of existing climate-resilient agricultural support and develop and implement recurring training strategy to fill identified gaps Output 1.2.2. Identify and empower climate champions for effective peer-to-peer learning and project outreach Output 1.2.3 Feedback loop for learning from activities on the ground		
2. Innovative climate risk transfer mechanism rolled out and smallholder farmers' resilience built through integrated approach	2.1 Smallholder farmers adopt sustainable pathways for climate risk transfer and diversified livelihoods	Output 2.1.1. Risk transfer mechanism for smallholder farmers implemented and scaled up Output 2.1.2. Farmers have increased access to savings products and microfinance Output 2.1.3 Linkages facilitated to enhance diversified livelihoods through value chain and marketing support for climate-resilient value chains	Bhutan	2,990,000
3. Innovative climate risk management institutionalised for long-term sustainability	3.1 Strengthened capacities for sustainable climate risk transfer through microinsurance	Output 3.1.1. Strengthen capacities at different levels for institutionalising innovative climate risk management Output 3.1.2. Develop enabling environment and advocate for institutionalising of innovative climate risk management	Bhutan	300,000
Project Execution cost				398,050
Total Project Cost				4,588,050
Project Cycle Management Fee charged by the Implementing Entity (if applicable)				389,984
Amount of Financing Requested			**USD**	**4,978,034**

The project will contribute to the Adaptation Fund's Innovation Pillar expected results: **ER1**: Successful innovations rolled out. Innovative adaptation practices, tools and technologies that have demonstrated success in one country spread to new countries/regions; and **ER4** - Evidence base generated. Evidence of effective, efficient adaptation practices, products and technologies generated as a basis for implementing entities and other funds to assess scaling up. The project is aligned with the Adaptation Fund's revised strategic results framework, in particular with **Outcome 6:** Diversified and strengthened livelihoods and

sources of income for vulnerable people in targeted areas; and with **Outcome 8**: Support the development and diffusion of innovative adaptation practices, tools and technologies. Specific outputs the project will contribute to are **Output 6**: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability; and **Output 8**: Viable innovations are rolled out, scaled up, encouraged and/or accelerated. The project will contribute to the AF's impact-level result of "Increased adaptive capacity of communities to respond to the impacts of climate change".

D. Projected Calendar

Milestones	Expected Dates
Start of Project Implementation	July 2023
Mid-term Review	January 2026
Project Closing	July 2028
Terminal Evaluation	January 2029

PART II: PROJECT JUSTIFICATION

A. Project components

The project will deliver an integrated package of interventions, through three interlinked components, to address key causes of vulnerability to climate change and food insecurity for smallholder farmers in vulnerable dzongkhags in Bhutan. Smallholder farmers, primarily women with heightened vulnerability to climate change, will gain access to innovative index insurance by investing their time and labour in adapting their farming practices to be more climate resilient, leveraging off and strengthening existing initiatives, including climate-smart agriculture (CSA) and good agricultural practices (GAPs) for low-external input sustainable agriculture (LEISA), and organic agriculture which is a priority of the RGoB. This support will be layered with access to an integrated risk management package that includes enhanced access to climate services, financial savings, and microfinance, to complement and enhance the sustainability of the microinsurance, as well as improved access to structured markets for climate-resilient produce. This will enhance smallholder farmers' capacity to effectively participate in the food system by breaking the vicious cycle of climate change - food insecurity – lack of access to financial services and markets that undermines Bhutan's agricultural system.

The LIG will be framed within the goal of sustainable transformation of Bhutan's agricultural sector, as part of post-COVID-19 recovery, and developed to leverage WFP's comparative advantages in support of the RGoB's policy priorities and the identified needs on the ground. The bulk of the project funding will go to support innovative and 'concrete' adaptation activities on the ground; the identified innovation of **index-based microinsurance** (either weather index insurance or area yield index insurance) will be layered with risk reduction activities (enhanced access to climate services and climate resilient agricultural technologies and inputs), micro finance to generate a positive tangible impact on the lives of vulnerable communities.

The project's innovation strategy will be to roll out the primary innovation in the Bhutanese context of micro index insurance for smallholder farmers in an integrated and iterative fashion that harnesses multiple perspectives on innovation and promotes the integration of secondary, local-level innovations that have demonstrated effectiveness in the project localities. This will include building on traditional and cultural knowledge and practices, for example to strengthen dissemination of targeted and localised climate services. The innovation strategy includes institutionalising this innovative approach to climate risk management by strengthening private sector, civil society and government capacities at different levels, supporting smallholder farmers to advocate for the benefits of the approach, and developing the enabling environment to ensure ongoing sustainability.

A graduation strategy will be included that supports farmers in a sequential way to take over paying the insurance premium, which will be initially covered by the project. Building on existing initiatives in the project areas, farmers will be provided with financial literacy training that underscores the importance of an integrated approach to managing climate and disaster risks --- highlighting the critical role of insurance, short-term and long-term savings, microfinance and investing in productive assets.

A key theme running through the project logic is for evidence-based and systematic approaches that build systems for sustainability and further scaling out.[89] A critical part of the sustainability strategy is the development of an effective distribution strategy, to ensure farmers can access insurance when they wish. This entails establishing an insurance ecosystem for accessible, affordable and beneficial microinsurance.

In line with the policies of the RGoB, the AF and WFP, as well as in recognition of the findings of the Gender Assessment, gender equality and women's economic empowerment is a central element of the project design. Beneficiary targeting and design of activities will be carried out to meet these goals in a tangible way.
In addition to mainstreaming gender in a meaningful way, the project will promote entrepreneurship and private sector participation in climate change responses, especially with respect to women, youth, and micro, small and medium enterprises (MSMEs).

Component 1: Strengthened climate-resilient agricultural practices to underpin integrated climate risk management by smallholder farmers

Component 1 focuses on enabling risk reduction to decrease overall exposure to more frequent and less severe climate risks on the part of smallholder farmers, through two main windows. Firstly, the project will facilitate linkages with existing climate services in the project localities so that the project beneficiaries can make more climate risk-informed decisions on their farming and livelihood systems. The project will provide additional support to gender-responsive digitalised dissemination of climate services, where this is feasible. Secondly, the project will support farmers to adopt behaviours that will improve their capacity to withstand future shocks, such as good agricultural practices, conservation agriculture and/or organic agriculture techniques combined with post-harvest loss management activities. The essential activity of sensitisation of farmers so that they understand how the index-based microinsurance functions and what the benefits could be for them will also take place under Component 1.

Outcome 1.1 Strengthened access to last mile climate services and increased understanding of smallholder farmers on index insurance benefits

Output 1.1.1. Linkages facilitated with existing climate services and support to gender-responsive digitalised dissemination

In order to avoid duplication and build synergies with other initiatives, and at the express wish of the GNHC, which is the Designated Authority (DA) for the Adaptation Fund (AF) in Bhutan, the project will focus under Output 1.1.1 on facilitating linkages to existing *localized* climate services linked to adaptation planning and implementation. There are several existing / planned initiatives that will invest in enhancing climate services for smallholder farmers in Bhutan, including the UNDP / Green Climate Fund (GCF) project 'Supporting Climate Resilience and Transformational Change in the Agriculture Sector in Bhutan'; and the World Bank / Japan / European Union-funded 'Strengthening Risk Information for Resilience' project. In addition, the endorsed AF Concept Note (CN) submitted by the Bhutan Trust Fund for Environmental Conservation (BTFEC), which is a National Implementing Entity (NIE) accredited by the AF, included an output on enhancing climate services, but it is understood from discussions with BTFEC that this may be removed from the final proposal to be submitted to the AF. The planned FAO GCF project on the Water Flagship will also contain activities to improve forecasting and climate services, particularly with respect to pests and diseases. In all of these cases, the LIG will build on and enhance where necessary the activities. Likely areas of enhancement are with respect to gender-responsive digitalised dissemination, to overcome barriers experienced by women in accessing climate services in general and digital services in particular; as well as bringing in WFP skills on last mile climate services (LMCS) to ensure that climate services are culturally appropriate, and to enhance their targeting and localisation, for greater uptake and effectiveness.

Output 1.1.2. Sensitisation of targeted smallholder farmers on the benefits of index-based microinsurance

WFP's demonstrated global experience with rolling out the tested innovation of index-based microinsurance has highlighted the importance of spending adequate time on sensitisation of targeted smallholder farmers on the benefits of index insurance, as a crucial element in the sustainability strategy. This can be delivered working through WFP's Social and Behaviour Change Communication (SBCC) approach, tailored to suit the Bhutanese context. This will be synergised with the last mile climate services (LMCS) activities under Output 1.1.1, to ensure that the LIG activities benefit from a more climate risk-informed approach. The sensitisation of farmers on the benefits of index-based microinsurance will be designed to build on traditional and cultural

[89] The project will also ensure that it avoids an ad hoc approach and supports the building of long-term institutional systems and programmes in Bhutan, including with respect to implementing the 12th Five Year Plan, the 21st Century Economic Roadmap, the National Climate Change Policy, the National Adaptation plan (NAP) under development, etc.

knowledge and practices in Bhutan, to represent an additional innovative element in the process of rolling out the microinsurance.

Activities will be designed to build on traditional and cultural knowledge and practices in Bhutan; this will represent an additional innovative element in the process of rolling out the index insurance; should be synergised with Output 1.1.1 activities on enhancing access to climate services/LMCS. In addition, contextualised awareness raising material on the benefits of microinsurance and the integrated climate risk management strategy of the project will be developed. Output 1.1.2 will include activities to support dialogues on 'innovation to increase climate resilience' between research organisations and climate-vulnerable communities to engender action as well as a sense of hopefulness in rural areas with empty households and high youth unemployment. In addition to strengthening the engagement between research institutions and local communities, the outcomes of these innovation-research dialogues will be an input into the community adaptation plans under Output 1.1.3.

Sensitisation activities will be gender-sensitive, as will all awareness raising and training activities of the LIG. Specific ways in which this will be facilitated include as a minimum providing temporary free child care for training and awareness raising activities. The project will additionally advocate for and try to ensure (through other investment windows and partners) longer-term solutions to child care to enable women's economic empowerment in the project localities. Given the recognised feminization of agriculture in Bhutan, and women's enduring larger share in child care, this is seen as a fundamental element of enabling greater resilience of rural women farmers.

Output 1.1.3 Leverage ongoing local adaptation planning to assist smallholder farmers to plan their adaptation responses

In order to assist farmers so that their decisions on the risk reduction technologies they will adopt and how they could best optimise the role of insurance in their livelihoods are coherent and climate risk-informed, it is important that these decisions are made within a supported approach to local adaptation planning. To reduce duplication with other investments and avoid creating a parallel system of local level adaptation planning, the project will make linkages with and leverage off existing village- and gewog-level plans in which the project beneficiaries have already participated. In project localities where such plans have already been developed, the project will provide support to help farmers refine their existing planned adaptation actions. For example, the BRECSA project will develop local-level agricultural resilience plans, so where project localities overlap with the BRECSA dzongkhags, the project will not duplicate these activities but will synergise with the BRECSA project so that the planning process is shared where possible. Where no participatory local level adaptation planning has been carried out, the project will support a community-based adaptation planning process, informed by statutory requirements of the RGoB as well as WFP's expertise in community-based participatory planning (CBPP).

This output will draw on and integrate information from the sectoral climate risk assessment for agriculture and the climate change and vulnerability risk assessment carried out for all districts (and down to gewog level) under the NAP process; as well as WFP's Consolidated Livelihood Exercise for Analysing Resilience (CLEAR) process that is planned under the BRECSA project, which is intended to inform national and local level adaptation planning roll out. As the CLEAR will cover the entire country, the LIG will make use of the disaggregated livelihoods and climate risk information in detailed design during the development of the full proposal, if the CLEAR has already been completed by then; as well as in local level planning and implementation of the LIG. Disaggregated information from the development of the insurance index, which will include delineating downscaled agro-ecological zones, can also be used in the local-level planning. Using all of these sources, the project will provide clear and distilled messaging, designed for both literate and illiterate community members, on current and future climate risks that will support farmers to make informed adaptation decisions.

Outcome 1.2 Strengthened capacities for climate-resilient agricultural support and incentives for sustainable resilience building

Output 1.2.1. Carry out stocktaking of existing climate-resilient agricultural support and develop and implement recurring training strategy to fill identified gaps

Output 1.2.1 is designed to deepen the risk reduction impact of the climate services activities under Output 1.1.1. Risk reduction is an essential complement to insurance, as it contributes to reducing the effects shocks have on households and communities, increasing farmers' adaptive capacity to climate change. Thus, risk reduction decreases the overall exposure to weather shocks, allowing the insurance to be focused on the low frequency / high impact years and thus helping to keep the cost of insurance to acceptable levels.

This output will involve carrying out a stocktaking of existing activities and capabilities for climate-resilient agricultural support, identify gaps and develop a recurring training strategy for the chosen risk reduction (NRM) conditionality – will bring together existing extension plans and capacity development initiatives and other elements in the dzonghags / localities. The project will then implement the identified capacity development activities including enhanced training for agricultural extension officers and support for farmer-to-farmer learning on a recurring basis. This may include some support to the capacity development activities of existing projects and initiatives, as well as some additional capacity building activities where required.

The specific NRM and climate resilient agricultural technologies to be implemented will depend on the exact project localities and associated climate risks, as well as the focus on specific crops to be insured that will be determined through detailed feasibility studies during full proposal development. However, it is likely that the project will adopt a two-fold approach in order to experiment with and encourage secondary innovations in the process of rolling out the primary innovation of index-based microinsurance:

- In some of the dzongkhags, the project will support climate resilient agricultural technologies and good agricultural practices (GAPs) for low-external input sustainable agriculture (LEISA); while
- In other project dzongkhags with suitable conditions and agricultural products, the project will directly promote organic agriculture, which is a priority of the RGoB.

An example of the former approach would be the promotion of GAPS and conservation agriculture as a conditionality for receiving access to the microinsurance in the production of maize which is at sufficient scale in the more remote and neglected eastern parts of the country. These areas have high poverty levels and in general the most significant climate risk is increasing drought and dry spells in the growing period. In this case, conservation agriculture, which has proven effective in many dry and drought-stricken parts of the world, and on which there has only been minimal training in Bhutan to date, would be an effective conditionality for insurance.[90] The institutional base in the east is strong with respect to research centres that could partner with the project. Although the focus will be on low-external input sustainable agriculture (LEISA), the project will not encourage or provide any chemical inputs, but rather support farmers to adopt LEISA as a potential pathway towards organic production, where this may be feasible.

Regarding the latter approach, the Department of Agriculture (DoA), through the National Centre for Organic Agriculture (NCOA) has indicated that Tsirang is an example of a dzongkhag where organic production could be the conditionality for receipt of microinsurance under the project and is supportive of the approach of using insurance as a risk transfer factor and to stimulate the more formal transition to organic agriculture. The latest Intergovernmental Panel on Climate Change (IPCC) Assessment recently emphasised the need to expand organic agriculture for multiple benefits: reducing GHG emissions from agriculture, improving soil fertility, promoting biodiversity and enhancing grassroots adaptation. Moreover, there are examples in the region of successful approaches at scale using no chemicals. Comparison of climate resilience indicators across organic and conventional rice systems in the Philippines indicated that organic rice systems are more climate resilient than their conventional counterparts.[91] [92]

The National Organic Flagship Programme (NOFP), which falls under the DoA, was launched two years ago in clear evidence of the high policy priority of organic production.[93] It has the following components: (i) Increased organic production of bio-inputs leading to phased import substitution of agrochemicals; (ii) Enhanced organic value chain and marketing through private sector engagements and enterprise development; and (iii) Organic standards, inspections and certification system developed and implemented. The 2021 transformative pathways for Bhutan's food systems emphasizes that to achieve the policy priorities for pursuing organic production, facilities and enterprises to provide organic seeds, organic composts, biofertilizers, bio-feed and bio-pesticides will be fast tracked and established; these are intended to be operationalised by 2024.[94] Bhutan has a comparative advantage over other countries in the region for organic production in that very low levels of chemicals are used across the country, thus reducing conversion costs. According to the 2019 RNR Survey, just under 95 percent of farms use farmyard manure or compost, while only 25 percent use chemical fertilizers and five percent of farms use protective coverings (plastic houses,

[90] Head of Programmes, National Centre for Organic Agriculture, Yusipang; personal communication, 16/06/22.
[91] Heckelman A, Smukler S, Wittman H (2018). Cultivating climate resilience: a participatory assessment of organic and conventional rice systems in the Philippines. Renewable Agriculture and Food Systems 33, 225–237. https://doi.org/10.1017/ S1742170517000709
[92] A further example is the Zero Budget Natural Farming (ZBNF) involving more than 100,000 farming families in Andhra Pradesh, India, with multiple food security, social, and environmental benefits. ZBNF deploys a range of farming methods, including applying fermented microbial culture to the soil, intercropping and mulching https://www.fao.org/agroecology/detail/en/c/443712/ last accessed 11/07/22.
[93] A total of 10,095.29 acres of farmland across the country operated by 1,265 households has been registered for organic production. Maximum agriculture area registered during is from Samtse, Sarpang, Samdrupjongkhar, Zhemgang, Paro and Tsirang. https://flagship.gnhc.gov.bt/nofp-fp/ accessed 03/07/22.
[94] MoAF (2021) Food Systems for Gross National Happiness: transformative pathways for Bhutan.

glasshouses, or shades).[95] The two main areas of agricultural chemical use are fertilizer for potato, which is grown at scale; and insecticides against weevils for rice. There is an opportunity in Bhutan to produce organic fertilizers which would also reduce impact on the soil; these, together with biopesticides are being tested and scaled up. There is evidence that Bhutan could harness the considerable potential for organic agriculture by promoting an integrated approach, which should include organic management practices such as growing fodder legumes;[96] the stocktaking activity under Output 1.2.1 will investigate and make recommendations to fill any identified gaps in the promotion of organic, as well as other climate resilient agricultural technologies in Bhutan. While Bhutan has locally developed organic standards and certification, barriers to increased benefits for smallholder farmers include better market access both domestically and internationally. The project will implement activities to overcome these barriers under Output 2.1.3.

During full proposal development, the possibility to engage with the emerging area of development of certified commodity-based organic landscapes will be considered, in line with the DoA's recent exercise on the 'Future of Organic Farming'.[97] Promoting landscape-based organic farming for enhanced production and sustained livelihood systems is one of the adaptation strategies identified in the recent climate change risk assessment for the agriculture sector.[98] The NCOA of the DoA has indicated that areas next to forests are particularly suitable for this, as all state forests are organic.[99] Geographical opportunities include rice landscapes in the south and west of the country, and the Paro Valley landscape. The process for delineating organic landscapes could be completed in 3-6 months and includes discussing this with the dzongkhag government and then identifying an agreed area to be delineated through community consultations. As the DoA is already in the process of requesting districts for organic proclamation, this could be consistent with the time frames envisaged to develop the full proposal. Almost the whole district of Tsirang is *de facto* organic and a gewog with very good agricultural extension has been identified by the NCOA as a potential starting point. Youth groups cultivating state land with a land use certificate (LUC) are amongst those registered for organic production, thus indicating the potential of this approach to engage female and male youth in the project's activities.

Under the integrated resilience building approach adopted by the project, when registering as beneficiaries for the microinsurance, farmers will commit to specific NRM and climate resilient agricultural technologies as a conditionality for accessing subsidised insurance premiums through the project funding. Thus Output 1.2.1 will be carried out in conjunction with Output 2.1.1 in each project locality, supported by the sensitisation activities under Output 1.1.2 and complemented by the enhanced access to financial services under Output 2.1.2 and the linkages facilitated to enhance diversified livelihoods through value chain and marketing support for climate-resilient value chains under Output 2.1.3.

Output 1.2.2. Identify and empower climate champions for effective peer-to-peer learning and project outreach

Under Output 1.2.2, the project will identify climate champions (lead farmers and farmer groups) building on the approach taken by the Commercial Agriculture and Resilient Livelihoods Enhancement Programme (CARLEP) and empower them to serve as advocates for further uptake and scaling out of the prioritised innovation of index insurance, as well as the integrated resilience building approach through which the insurance will be delivered. In line with the project's targeting approach, the majority of the climate champions will be women, with a focus as well on youth.

Output 1.2.3 Develop learning and knowledge management strategy and develop feedback loop for learning from activities on the ground

Output 1.2.3 will focus on developing the project's learning and knowledge management (L&KM) strategy and on designing a feedback loop for learning from a range of activities that take place on the ground. This will include the feedback loop to continuously improve the insurance product, which will include *inter alia* feeding back the daily rainfall data on a monthly basis to the project management unit, as well as National Centre for Hydrology and Meteorology (NCHM) and the Department of Agriculture. A customer journey study will be an important part of implementation, as well as an alternative dispute mechanism to ensure that concerns and questions of farmers about the products and services are heard and addressed. While this

[95] MoAF (2019) RNR Census of Bhutan.
[96] Neuhoff, D., Tashi, S., Rahmann, G. et al. Organic agriculture in Bhutan: potential and challenges. Org. Agr. 4, 209–221 (2014). https://doi.org/10.1007/s13165-014-0075-1
[97] Under this approach, the first step would be identification of a suitable product for the market, after which the necessary support would be layered for certification for organic, access to finance, linkage to markets, etc., as a whole package of support interventions.
[98] RGoB and UNDP (2021) Assessment of climate risks on agriculture for National Adaptation Plan (NAP) formulation process for Bhutan.
[99] The NCOA has implemented a small project on model organic villages with ICIMOD that was close to completion at the time of development of the CN, involved one each in Wangdue, Sarpang, Haa, Luentse, and two in Chhukha (50 households in each village). Activities included developing the concept, definitions, and indicators, to set the scene for working with villages to gradually scale up to organic production.

should be the main responsibility of the insurer, there may need to be different levels of dispute resolution to ensure accountability. Additional details on the L&KM strategy are contained in Part II.I.

Component 2: Innovative climate risk transfer mechanism rolled out and smallholder farmers' resilience built through integrated approach

The bulk of the project budget will be allocated to Component 2 for the rolling out of index insurance, including for the necessary associated activities of increasing access of predominantly women farmers to savings products and microfinance and of facilitating concrete adaptation activities to enhance climate-resilient production, as well as diversified livelihoods through value chain and marketing support for climate-resilient value chains.

Rolling out the microinsurance will include capacity strengthening in the insurance sector (government and private) to facilitate the efficient and effective functioning of all players within the 'insurance ecosystem' – i.e. insurance companies, financial services providers, distribution channels, aggregators, and the insurance regulator. Under Component 2 the project will also investigate building on the existing digital marketing platforms and other digital platforms in Bhutan to enhance integration of localised agro-met advisories.

Insurance is only one part of an integrated portfolio of solutions, which is best suited to address specific risks from lower frequency / higher impact shocks. If insurance payouts are too frequent, the product would become too expensive, limiting its application in very high-risk areas or access to low-income populations. The project will leverage WFP's global expertise in delivering index-based microinsurance, which is an innovative type of insurance based on a proxy (a figure that can be used to represent a value) for losses. Index-based insurance compensates farmers based on changes in a pre-determined index correlated with agricultural yield (or harvest), rather than on-site assessments of actual damage incurred to crops due to insured risks. Insurance payouts are distributed to insured farmers if the index falls beyond a pre-determined threshold, for example when rainfall recorded over a certain period is below the value set in the index for drought coverage.

An insurance pre-feasibility study was conducted by WFP Insurance team at headquarters in Rome and a local consultant to gauge the conditions in place for rolling out the identified innovation. The study focused on: (i) Mapping of opportunities and barriers (country context, access to financial services); (ii) Supply of agricultural and climate risk insurance; (iii) Demand for agricultural and climate risk insurance by target group; (iv) Enabling environment (policy, regulatory and supervisory environment); and (v) Providing recommendations. Key findings of the pre-feasibility study are that while there is currently no insurer offering index-based climate risk microinsurance in the country, Bhutan has prioritised financial inclusion and there is a strong presence of microfinance institutions in the rural areas, with an existing pay-at-harvest pre-financing scheme and experience in bundling of credit and crop insurance (through which the insurance pay-out can be utilized for paying back loans). There is strong interest and willingness on the part of the insurance companies to engage in microinsurance, and strong demand from women and men farmers for suitable microinsurance products. Although there are currently no regulations to guide microinsurance in the country, the policy environment is strongly supportive of this approach (see Part II.F).

The insurance pre-feasibility study and numerous discussions with stakeholders have considered whether the index-based microinsurance delivered in Bhutan should be either weather index-based insurance (WIBI) or area yield index insurance (AYII). These two types of index insurance have different characteristics and strengths and weaknesses.

Under **weather index-based insurance (WIBI)**, payouts are triggered when a specific weather parameter such as rainfall measured by a particular weather station or satellite over a given period of time reaches a pre-determined threshold. The terms of the insurance contract are set to correlate, as accurately as possible, with the value of loss for a specific crop type or more broadly the impact of a weather event (drought, flood or strong winds). If the index reaches the threshold, subsequently all people insured in the defined area will automatically receive the same payout without assessing individual losses.

With **area yield index insurance (AYII)**, payouts are based on the realised average yield of a geographic area such as a dzongkhag, gewog, or even a village, not the actual yield of the insured farmer. The insured yield is established as a percentage of the historical average yield for the area. A payout is triggered if the realised yield for the area is less than the insured yield, regardless of the actual yield achieved on the insured individual's farm. Credible and consistent yield data over a multi-year time period at the selected scale of geographic area is required to effectively design this type of index insurance product.

The following are similarities between the two:

- **Transparency**: Index insurance contracts usually allow the policyholder direct access to the information on which the pay-outs will be calculated. Trust is strengthened by transparency.

- **Low operational and transaction costs**: Index insurance requires limited individual underwriting (client assessment). It can be distributed, and claims can be settled, at a relatively lower cost.
- **Lack of adverse selection:** Index insurance requires that all insured farmers within the defined area have the same insurance pay-out conditions, regardless of their specific risk exposure.
- **Lack of moral hazard**: All producers in the defined area are treated equally.

The following are differences between WIBI and AYII:

- **Sources of Data**: WIBI will require weather data such as rainfall while AYII will require the historical average yield of the area to establish the indices.
- **Perils covered**: WIBI usually covers limited perils (usually one) and AYII may cover more perils because the basis of pay-out is the area yield.
- **Period of pay-out**: AYII takes longer because of the verification/crop cuts process.
- **Cost of service providers:** AYII can be more expensive because crop cuts are needed.

Furthermore, while AYII may cover more perils, it does require that the crop to be covered be specified. It is currently felt to be premature to specify this for the LIG as the detailed project planning will need to carry out a more in-depth vulnerability assessment and climate risk-based crop suitability assessment under changing climatic conditions, to ensure that farmers are not encouraged to continue with specific crops and livelihood systems that may become unfeasible in the near- to medium-term, as climatic impacts intensify. In addition, an important issue raised in the stakeholder consultations is the need for a more 'tailor-made' insurance approach that can address the varying needs of different smallholder communities in Bhutan, given the different micro climates, livelihoods systems and climate risks associated with Bhutan's diverse topography and huge range in elevation within gewogs across the country.

Therefore, it is proposed that the Bhutan LIG will support the development of several different indices and insurance products to cover a range of different crops that are both climate resilient and adapted to the risks going forward into the future within specific localities, and can also be produced at sufficient scale so that there is enough aggregation upon which to base effective value chains and marketing linkages. This is important to ensure that farmers can realise significant livelihood gains and insurers can maintain effective and sustainable insurance products. The findings of the more in-depth vulnerability assessment and climate risk-based crop suitability assessment will feed into the detailed insurance feasibility assessment, also to be conducted during full proposal development, to determine the specific forms of index-based microinsurance that are most appropriate for the identified project localities. This will be documented and substantiated in the full proposal. Once the nature of the index has been identified, the index itself can be developed in under three months.

According to the DoA, priority crops for consideration are rice, maize, potatoes, and chilies. During full proposal development, these crops will be considered together with other options under the in-depth vulnerability assessment and climate risk-based crop suitability assessment to be conducted. This is an important step to avoid unintentionally promoting maladaptation. The DoA and other stakeholders have also indicated the importance of including more traditional, climate-resilient and nutritious crops that are likely to have good export markets as well, such as millets and buckwheat, as well as quinoa that was introduced successfully in 2015, has been promoted in all 20 dzongkhags and has been targeted as a crop for upscaling to enhance household food and nutritional security as well as diversify farmers' cropping systems, as it will be climate-resilient going into the future.[100] Quinoa has been mainstreamed into the dzongkhag 12th Five Year Plan (FYP) targets, resulting in the production of 77 MT in 2019.[101] Ginger, turmeric, adzuki beans, buckwheat and quinoa have been identified by the DoA as providing the main upscaling potential for organic production, particularly for export. There is also good potential for organic production of priority fruit, such as apples and cherries. The NCOA of the DoA is currently testing germplasm for cherries at its Yusipang research centre; cherries have also been included as a priority high-value tree under the recently inaugurated One Million Fruit Trees programme.

Preliminary indications of suitable commodities to include in the LIG are maize in the east of the country[102], paddy in the south and west where it is a commercial crop, and (organic) vegetables in Tsirang – for example potatoes and chillies – in the south central part of the country. The potential for more nutritious cereals such as millets, buckwheat, and quinoa will also be considered. For the organic sector, Chhukha and Samdrupjongkhar are important dzongkhags with good scalability for the priority commodities of ginger,

[100] RGoB and UNDP (2021) Assessment of climate risks on agriculture for National Adaptation Plan (NAP) formulation process for Bhutan.
[101] Ibid.
[102] Potential districts to be considered in the east of the country include Trashigang, Lhuentse, Pemagatshel and Samdrup Jongkhar.

turmeric, and buckwheat provided there is good value chain and market development. The in-depth vulnerability assessment and climate risk-based crop suitability assessment under changing climatic conditions will be conducted and documented in a rigorous fashion during full proposal development. The results will be used to fine-tune the activities set out in the full proposal so that the project addresses the key needs of vulnerable smallholder farmers in the most effective and sustainable fashion.

The AF funding to support insurance premiums will only be applied to vulnerable smallholder farmers, as a central part of the project's strategy to assist them to graduate from purely subsistence to producing and marketing a surplus, to make their livelihoods more climate resilient. The insurance providers will also offer the appropriately structured insurance product to a mix of farmers from different economic levels, including those that are engaged in commercially viable crop production activities. To realise the RGoB's policy goal of increasing national food security, Bhutan's commercial farmers, who are also generally smallholders, also need crop insurance that is affordable and accessible as they face the same climate risks as subsistence farmers. Offering the index-based insurance solutions to those smallholders that have already graduated from subsistence to commercial production will provide additional opportunities for scaling up, expansion, and insurance cross-selling because of their higher capacity to pay. This will contribute to the sustainability of the insurance product over time.

Outcome 2.1 Smallholder farmers adopt sustainable pathways for climate risk transfer and diversified livelihoods

Output 2.1.1. Risk transfer mechanism for smallholder farmers implemented and scaled up

Under Output 2.1.1, the risk transfer mechanism of microinsurance for smallholder farmers designed to focus on the low frequency / high impact years, to keep cost down, will be implemented and rolled out. This will be done in a systematic and sequential approach, building on WFP's considerable experience with index-based insurance as a climate risk transfer mechanism. In the first year (Y1) of the project's implementation, a prototype index designed specifically for the localised Bhutanese context will be validated in one or more dzongkhags, targeting an estimated 10,000 farmers, of whom at least 7,000 will be female.

Project activities will concurrently enhance capacities and formalise key partnerships at different levels that will lead to the roll out of insurance – for example, with the insurance companies, the distribution channels, and with aggregators and farmers' groups. During Y2 – Y5, index-based microinsurance will be rolled out in all of the project localities, according to the pre-determined graduation strategy. Recurring community consultations will be conducted to share the results of the index, and to assess the accuracy of the product compared to the actual experience of farmers. In this respect, detailed project design during the full proposal development will consider whether to install manual rain gauges or more automated systems in project locality villages. In either case, lead farmers would be trained to monitor and keep records of the season's rainfall, and provide daily rainfall data on a monthly basis during the season so that the performance of the index can be assessed and fine-tuned. This is an important step for weather index-based products.

Output 2.1.2. Farmers have increased access to savings products and microfinance

Under this output, the project activities will assist smallholder farmers to be able to absorb smaller and more frequent risks without resorting to negative coping strategies. These will take the form of assisting households to build monetary or in-kind savings by facilitating linkages with existing savings products and micro finance service providers. Steps will be taken to raise awareness for women on accessing existing products and on reducing gender-based barriers to this. The project will facilitate linkages with the ADB / Bhutan Development Bank project and other programmes that have an 'access to finance' component. The ADB-funded project includes financial literacy training and business development support for rural SCIs (small and cottage industries), especially those owned by small and marginal farmers and women.

Output 2.1.3 Linkages facilitated to enhance diversified livelihoods through value chain and marketing support for climate-resilient value chains

WFP's experience has shown the advisability of including some elements of post-harvest and value chain work on selected commodities when promoting microinsurance, so that the targeted farmers can gain increased income and diversified farming livelihoods through value addition and greater access to markets. Under the LIG, this will include providing additional technical assistance and small-scale inputs to reduce post-harvest losses, as well as value chain and market linkage work on selected climate-resilient commodities, both non-organic and organic in line with the two-pronged approach identified under Output 1.2.1. Where there is geographical overlap, the project will leverage off the relevant activities of existing and planned interventions, including CARLEP, BRECSA, and the National Organic Flagship Programme.

When identifying the climate-resilient value chains to be developed, the project will develop clear criteria and consider both those that are nutrition sensitive, as well as high-value commodities targeted at both the

domestic and export markets, for sustainable increase in farmers' incomes. Bhutan's comparative advantages will also be factored in; for example, the country enjoys strong seasonal climatic advantages compared with its neighbour to the south, India, allowing it to produce temperate zone crops (typically fruits and vegetables) during the May to October monsoon period in India, when temperatures at lower latitudes are generally too high for these crops. Thus there is good potential for developing the (organic) value chain and marketing linkages for selected high-value fruits and/or vegetables, for export to India. The project will promote entrepreneurship and private sector participation in climate change responses, especially with respect to women, youth, and micro, small and medium enterprises (MSMEs), by working with women's groups, youth groups, and other aggregators in the livelihood diversification activities. In the course of supporting the climate-resilient and nutrition-sensitive value chain work and facilitating the marketing of climate-resilient varieties and products, the project will also investigate building on the existing digital marketing platforms and other digital platforms in Bhutan to enhance integration of localised agro-met advisories.

Bhutan has locally developed organic standards and certification, and organic farming has been identified as an opportunity for expansion of agribusiness in the RNR Strategy 2040.[103] In those localities where the project will support organic production, it will work closely with the Bhutan Agriculture and Food Regulatory Authority (BAFRA), which is the certification body that is now accredited with the authorities in India and linked with the Sikkim Organic Mission. It will also partner with Brand Bhutan, which aims at diversifying the export market and is not just about selling products but remaining true to Bhutanese ideals and inherent values as expressed in the philosophy of Gross National Happiness. 'Bhutan Natural' is the branding for locally certified organic products from Bhutan that are not formally accredited, targeting EU and Japan. A local private sector partner has conducted an initial marketing study for buckwheat and adzuki beans; there is already a value chain for buckwheat. The NCOA has indicated that there is a need for additional development of the branding for organic and natural, which should include the elements of smallholder clean production in mountain environments. The project will support the further development of branding and marketing of smallholder organic products to reflect this ethos, in close partnership with the NOFP, the NCOA, and Brand Bhutan.

Component 3: Innovative climate risk management institutionalised for long-term sustainability

Under Component 3 the project will implement activities to institutionalise the project's innovative climate risk management approach of index-based microinsurance delivered in an integrated resilience building approach for long-term sustainability. Through these activities, the project will develop capacities and mechanisms to also promote the further scaling up of the activities beyond the project localities, with the aim of ultimately covering all 20 dzongkhags of Bhutan, as well as a broader range of livelihood systems and groups.

Outcome 3.1 Strengthened capacities for sustainable climate risk transfer through microinsurance

Output 3.1.1. Strengthen capacities at different levels for institutionalising innovative climate risk management

This will include capacity strengthening of Government officials at different levels, as well as private sector, so that the LIG's approach can be institutionalised for ongoing sustainability and wider impact. Enhanced capacities of the extension services for climate resilient agricultural technologies, as well as of a range of stakeholders for enhanced provision of localised and targeted climate services, will have already been developed under Component 1. Component 2 includes enhancing capacities and formalising key partnerships at different levels of the insurance ecosystem that will lead to the roll out of insurance for the project beneficiaries. Thus Output 3.1.1 will focus on the missing element of developing and ensuring ongoing support for the long-term effective functioning of the insurance ecosystem. In the early stages of the project's implementation, the key capacities that require further support will be identified according to the different stakeholder groups in the insurance ecosystem – for example, the insurance companies, the microfinance institutions, and the insurance regulator. Officials from the MoAF and aggregators will also be included in this more systemic form of capacity development, so that a comprehensive and shared understanding of the functioning of the integrated approach to climate risk management is developed.

Output 3.1.2. Develop enabling environment and advocate for institutionalising of innovative climate risk management

Associated with the capacity strengthening under Output 3.1.1, the project will provide the necessary support to develop the enabling environment for index-based microinsurance for smallholder and other farmers. While many stakeholders have confirmed that the policy environment is favourable towards microinsurance, in that

[103] MoAF 2021, RNR Strategy 2040, Policy and Planning Division, Ministry of Agriculture and Forests, Thimphu, Bhutan.

it is a stated policy priority in numerous official documents, it is likely that new regulations will be required to further the institutionalisation and scaling up of the insurance products and approaches developed.

The project will also develop advocacy tools for institutionalising the approach of innovative climate risk management, for use within Bhutan and to share lessons from the project in the region and beyond. This will include evidence generation for example on cost-impact analysis, to influence the microinsurance policy environment. Farmers will also be supported to advocate on their experiences to promote scaling up and development of a sustainable distribution strategy in Bhutan.

B. New and innovative solutions to climate change

The main element of the project's innovation strategy is to roll out WFP's innovation of index-based microinsurance for vulnerable smallholder farmers delivered in an integrated climate risk management and resilience building approach – as described above and under Part II.C below. This is a tried-and-tested innovation in other parts of the world that is completely new to Bhutan. While the primary focus is on rolling out this mature innovation, opportunities have been identified during design of the CN to promote the integration of secondary, local-level innovations that have demonstrated effectiveness in the project localities. This process of integration between the primary mature innovation of index-based microinsurance with secondary Bhutanese innovations will be carefully documented so that the new knowledge developed can be shared more broadly, and evidence generated to substantiate its effectiveness.

This innovation process will include building on traditional and cultural knowledge and practices, for example to strengthen dissemination of targeted and localised climate services. The sensitisation of farmers on the benefits of index-based microinsurance will also be designed to build on traditional and cultural knowledge and practices in Bhutan, to represent an additional innovative element in the process of rolling out the microinsurance. This sensitisation can be delivered working through WFP's Social and Behaviour Change Communication (SBCC) approach, tailored to suit the Bhutanese context.

In collaboration with the National Centre for Organic Agriculture (NCOA) and the National Organic Flagship Programme of the DoA, the project will use the risk transfer factor of insurance to stimulate the more formal transition to organic agriculture in some of the project localities. This represents a further secondary innovative element designed to contextualise the mature innovation of index-based insurance to the Bhutanese situation – as in general organic production has not been used as a conditionality for delivering index-based insurance in other parts of the world.

A further area for secondary innovation in the project concerns the integration of digital technologies and applied tools into the insurance roll-out process. Thus, under Component 2 the project will investigate building on the existing digital marketing platforms and other relevant digital platforms in Bhutan to enhance integration of localised agro-met advisories, to provide a more seamless applied tool to assist project beneficiaries to develop more climate resilient livelihoods. Moreover, the DoA has advised that the Agriculture Machinery Centre[104] in Paro will be transformed into an Agricultural Innovation Centre, to develop innovative technologies, including automation. The 'Agriculture 4.0' transformation in Bhutan is envisaged to bring in hydroponics, soil-less cultivation, smart irrigation, etc. These kinds of technologies can be combined with agricultural marketing and are especially likely to attract youth to agriculture. During full proposal development, once the project localities have been identified, the most suitable secondary innovations under the 'Agriculture 4.0' approach will be integrated into the project's innovation strategy.

C. Rolling out / scaling up innovative adaptation solutions

The project will roll out WFP's successful integrated approach of delivering index-based microinsurance for smallholder farmers, which has been tried and tested over more than a decade in sub-Saharan Africa, Latin America and the Caribbean, and increasingly in recent years in Asia. As index-based microinsurance has not been implemented in Bhutan, it represents a primary innovation in the Bhutanese context that will also generate valuable lessons for the Asia-Pacific region as a whole. From a coverage of zero percent in the project localities, the proposed LIG project will roll out microinsurance to a target of 40 to 50 percent of smallholder farmers in the project dzongkhags using a graduation strategy to enable farmers to assume full payment of the premium by the end of the project's lifespan.

The index-based microinsurance for smallholder farmers in Bhutan will be rolled out using WFP's proven integrated resilience building approach. Since 2011, WFP has worked with Governments and private sector partners to insured 2.7 million people in 19 countries; insurance products have disbursed USD 4.7 million in payouts to 576,000 people. Under WFP's approach, insurance is not only a protection mechanism to respond rapidly to shocks, but by protecting investments, it allows farmers to increase production and incomes in good

[104] http://www.amc.gov.bt last accessed 25/07/22.

years, enabling them to transition from subsistence farming to producing a surplus for selling to markets. This will gradually allow farmers to access insurance commercially and contribute to the overall sustainability of the initiative. However, while insurance can promote risk taking by households, it requires complementary actions such as business advisory services, predictable market access and improved access to financial services. Therefore, it is important that the right partners are identified for these actions.

In this regard, the process to roll out insurance within the integrated resilience building approach will build strong multi-stakeholder partnerships and harness multiple perspectives on innovation to further contextualise and optimise the primary tested innovation for the Bhutanese context. Partnerships with research and innovation groups will be leveraged – for example, with WFP's Innovation Accelerator[105] to source and qualify additional innovative solutions to enhance specific elements of WFP's microinsurance process, such as monitoring systems for insurance products and indexes to increase the transparency of the end-to-end process for all stakeholders; and will be fostered – for example, between Bhutanese research and academic institutions and smallholder farmers, in order to identify and leverage existing secondary innovations that are already being deployed by community members to enhance their climate resilience, and by research and extension services to develop and disseminate simple and effective adaptation technologies and tools for smallholder farmers. The effectiveness and sustainability of the microinsurance depends upon solid partnerships between banks and microfinance institutions, index insurance technical service providers, insurance companies, distribution channels and aggregators, and between all of these members of the insurance ecosystem and the community members who will be the primary beneficiaries of this project. Through actively fostering these and other multi-stakeholder partnerships the project will support the creative power of innovators in Bhutan to expand their impact on building adaptive capacity and reducing vulnerability in Bhutan's rural areas.

The roll-out process will also include integration of relevant innovations developed under the small innovation grant of USD 250,000 received from the AF through the NIE, Bhutan Trust Fund for Environmental Conservation (BTFEC), entitled 'Building Adaptive Capacity through Innovative Management of Pests/Disease and Invasive Alien Species (IAS) in Bhutan to Enhance Sustainable Agro-Biodiversity and Livelihoods'.

D. Economic, social, and environmental benefits

Economic benefits

Increased income from increased and more climate resilient production, reduced post-harvest losses and more resilient and diversified livelihoods: enhanced provision of climate-resilient agricultural technologies and more consistent technical support and recurring training activities, including for organic production, as well as provision of inputs such as drought-tolerant, early maturing, and/or organic varieties, will result in surplus production for income generation. High levels of post-harvest losses (PHL) in the project localities have dramatically reduced household economies and prevented farmers from selling produce when there is no glut in the market, and mitigates against sustainable levels of income and expenditure. Project activities to reduce PHL will result in increased surplus, which can be sold during favourable market conditions, thus increasing income of women and men farmers. Furthermore, as production is enhanced and diversified into more climate-resilient varieties, the project will support the development of climate-resilient and nutritious value chains, including support to reduce post-harvest losses (PHL), to enhance processing, and to increase access to markets, including for organic produce. This will result in strengthened and diversified livelihoods, as well as increased income streams for smallholder farmers. A related indirect national benefit of increased purchasing of national produce, rather than of foreign imports, and of the reduction in imported chemicals due to organic production, is the contribution towards reducing national debt.

Reduced crop losses and increased income through provision of targeted climate and agricultural advisories: Under Output 1.1.1, the project will facilitate linkages to existing climate services for smallholder farmers and will enhance their gender-responsive dissemination, including through digitalised means. Thus smallholder farmers, especially women, will be able to plan and manage climate variability and risk benefit better, informed by timely climate information. The resulting economic benefits will accrue through avoidance of lost investments through crop failure, as well as maximised production under suitable conditions. A conservative estimate from the region is that farmers who adapt their agricultural practices based on weather advisories will increase their annual income by 50 percent.[106] Assuming two good years of harvest in the 5-year period

[105] The WFP Innovation Accelerator sources, supports and scales bold new solutions to disrupt global hunger and achieve the Sustainable Development Goals (SDGs). Since 2015, the WFP Innovation Accelerator has supported more than 100 projects, with 16 innovations scaling up to achieve significant impact. These projects have impacted 9 million lives in 2021 alone and will continue to do so, in support of WFP's humanitarian field operations. https://innovation.wfp.org last accessed 11/07/22.

[106] This is based on studies in India.

of the project, and based on an estimated 60 percent of the project's total direct beneficiaries of 10,000 households, with an average annual household income for the targeted smallholder farmers of USD 500,[107] this translates into an average increase per household of roughly USD 500 over 5 years for 6,000 households, or an increase in income of approximately USD 3,000,000 for the project as a whole. Actual figures might be higher as a result of the cumulative positive effects of the range of risk reduction and adaptation activities of the project; it is also likely that more than 60 percent of the targeted households will achieve this benefit.

Providing access to savings and microfinance: through this, households will be better able to manage smaller and more frequent shocks through building risk reserves, and access microcredit to facilitate their productive activities and livelihoods. Combined with the insurance, this will allow individuals to become more resilient to both smaller and larger shocks, whilst also being able to contribute towards the payment of their insurance premium over time. Savings have acted as a buffer for smaller shocks, and women participants in microinsurance in different countries have doubled their savings capacities. Microinsurance also plays a key role in unlocking access to financial services, acting as collateral to access loans. The number of participants accessing credit has doubled in Malawi after three years of WFP's microinsurance intervention, while farmers in Ethiopia have managed to borrow amounts five times higher than non- participants after five years. This has enabled participants to improve productive capacities with agricultural inputs, tools, and livestock. It is estimated that the project will result in at least a 50 percent increase in the number of targeted women farmers accessing credit.

Social benefits

Targeting of women farmers will improve agricultural output and improve nutritional outcomes: FAO has estimated that if women farmers had the same access to resources as men, agricultural output in developing countries would rise by an estimated average of up to four percent and reduce the number of undernourished people in these countries by as much as 17 percent, translating to up to 150 million fewer hungry people.[108] Given that the project will target at least 70 percent female beneficiaries and ensure their equitable access to resources needed to enhance their production, the project will deliver this social benefit in Bhutan. It is anticipated that an increase in the household food consumption score of at least 20 percent could be achieved by the project.

Reduced resorting to negative coping strategies through integrated approach to roll-out of microinsurance: When insurance is provided together with other risk management approaches, such as access to natural capital, information and finance, the synergies created by the different components lead to increased resilience capacity of participants. In Malawi, after 3 years of programme implementation, the percentage of participants with acceptable food consumption has increased from 56 percent to 89 percent. The percentage of households not resorting to negative coping strategies after a shock has increased from 40 percent to 72 percent.[109] It is estimated that the percentage of beneficiary households not resorting to negative coping strategies after a shock could be increased by at least 30 percent above baseline through the project's activities.

Enhanced gender equity and benefits for women and youth: A key thrust of the project will be economic empowerment of women and youth, to address the inequalities identified. At least 70 percent of the total beneficiaries will be female, and the project will adopt a number of actions to achieve gender empowerment and benefits, guided by the gender assessment findings. During the value chain assessment, gendered (and nutrition) analysis will be conducted to understand barriers women and other groups face in participating in value chains, and sustainable solutions will be developed to overcome them. The adaptation planning processes will be refined and/or implemented to ensure equitable participation of women and men in decision making on adaptation decisions. The project will support the development of women and youth climate champions and will take specific steps to remove barriers for women to attend awareness raising/training sessions like providing free child care.

Environmental benefits

Reduced soil erosion and enhanced soil fertility through conservation agriculture, good agricultural practices, and organic production: Farming in Bhutan is often carried out without any sustainable agriculture practices leading to annual soil loss of 3-21 ton per hectare.[110] The loss of topsoil poses a serious threat to food security as it significantly reduces the inherent soil fertility, soil organic matter and water retention capacity resulting in poor land productivity and crop yield. Loss of topsoil also exacerbates the risks of landslides associated

[107] This is an estimated average based on different figures reported in various documents; this figure will need to be further investigated during full proposal development.
[108] As cited in Yeshey, K. (2022) Gender Assessment Report for the Bhutan AF Larges Innovation Grant project. Report submitted to WFP Bhutan.
[109] WFP (2021) Does Climate Insurance Work? Evidence from WFP-supported microinsurance programmes.
[110] Soil Erosion Report, 2010, National Soil Services Centre, DoA, MoAF

with increased heavy rainfall events. Conservation agriculture, good agricultural practices, and organic production have been shown to increase soil fertility and reduce soil erosion in many contexts.

Enhanced natural resources, biodiversity and ecosystem services in project target areas: The conditionalities for farmers to access insurance, such as conservation agriculture, GAPs and organic production, will improve the natural resource base upon which livelihoods depend. In addition to the reduced soil erosion and enhanced soil fertility benefits mentioned above, the sustainable agro-ecological technologies supported by the project will prevent biodiversity loss through injudicious application of chemicals.

Reduced pressure on the natural environment: The project's resilience building and risk reduction activities will contribute to the transformation from subsistence to sustainable livelihoods for vulnerable people by (i) reducing pressure on landscapes and the natural environment (e.g. avoiding negative coping strategies such as deforestation); (ii) gradually increasing adaptive capacity through training, creation and management of climate adaptation assets; and (iii) improving productivity and building economic protection from shocks, thereby preventing relapse into poverty and renewed pressure on the natural environment. The increase in income and livelihood diversification, as well as risk transfer activities under Component 2, will serve to reduce the pressure on ecosystem goods and services derived from forests and rivers that are used by rural Bhutanese in the project target areas to supplement their livelihoods. These ecosystem goods and services themselves are being negatively impacted by climate change, currently largely due to the effects of heavy rainfall and landslides, as well as drying effects that result from increased temperature, and reduced and/or erratic rainfall.

In addition to the above social and environmental benefits, the project has been designed to avoid or mitigate negative impacts and is in accordance with national standards and safeguards. Further detailed consultations with relevant ministries, stakeholders and community members will be carried out during full proposal development to shape activity design to enhance economic, social and environmental benefits and additional consultations will be carried out during implementation under the project's participatory approach; in addition, technical support from experts in the field, especially in relation to sensitive or specialized services, including gender and protection issues as well as climate-resilient agricultural technologies, organic farming and environmental management, will be sought and integrated into further design, and will continue to be integrated into project activities during implementation

E. Cost-effectiveness of the proposed project

The cost effectiveness of the project has been assessed and is evident when compared with the status quo. Regarding the alternative of no project, the recent climate change-related impacts experienced in Bhutan and the strongly negative effects these are having on rural livelihoods and social cohesion linked to ongoing migration, constitute large costs for the state. These are incurred as the RGoB is attempting to steer the country back onto a steady economic path after the COVID-19 pandemic. The project will contribute to addressing the root causes of the exodus from the rural areas, which is fundamentally more cost effective than addressing the symptoms of rural and agricultural decline.

Concerning Component 1, the cost effectiveness and economic rationale for enhanced climate services has been demonstrated through global and regional studies. For example, in India, it is estimated that investment on generating reliable weather forecasts yielded a benefit of 50 times the initial investment in a year, with expected increased benefits in the next few years.[111] Farmers who adapted their agricultural practices based on weather advisories in India increased their annual income by up to 53 percent. A number of studies have provided evidence for the cost effectiveness of NRM-related risk reduction measures and resilience-building activities – for example, a DfID-funded study found the costs of building resilience are offset against the benefits, in benefit-to-cost ratios ranging from 2.3:1 to 13.2:1, depending on the country.[112] Assuming a fairly low benefit to cost ratio of 2.9:1, this would mean for every USD 1 spent on resilience, USD 2.9 of benefit (avoided aid and animal losses, development benefits) are gained.

Concerning Component 2, studies have pointed to the cost effectiveness of index-based microinsurance. A recent review[113] found a positive relationship between index insurance and uptake of more profitable production technologies and practices; it also noted that while social protection contributed resilience to climate shocks among Kenyan pastoralists, index-based insurance had a similar effect at lower cost.

[111] National Council of Applied Economic Research (2020) Estimating the economic benefits of Investment in Monsoon Mission and High Performance Computing facilities. Ministry of Earth Sciences, Government of India.
[112] Economics of Early Response and Disaster Resilience Study: lessons from Kenya and Ethiopia (2012); available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/67330/Econ-Ear-Rec-Res-Full-Report_20.pdf
[113] Hansen et al (2019) Climate risk management and rural poverty reduction. *Agricultural Systems,* Vol. 172, 28-46.

Concerning Component 3, a relatively small budget envelope will be needed to institutionalise the system of integrated provision of index-based microinsurance in Bhutan. This is likely to be highly cost effective as compared to the no-go option for this component, as failure to implement and institutionalise effective climate risk transfer mechanisms is resulting in extremely high costs for vulnerable smallholder farmers and mitigating against the transformation of the agricultural sector and Bhutan's food systems post-COVID.

F. Consistency with national or sub-national sustainable development strategies

The implementation of the proposed LIG will be governed by a range of national laws, policies, regulations and guidelines in Bhutan, including the overarching prescriptions emanating from the Constitution, and the sustainable development and environmental management legislative and policy frameworks. The proposed project is consistent with the policy priorities of the RGoB, including the GNH philosophy, the 12th Five Year Plan (2018-2023), the 21st Century Economic Roadmap, and the National Climate Change Policy (2020). The Bhutan LIG is designed to further the goal of sustainable transformation of the agricultural sector, as part of Bhutan's post-Covid recovery, to "Build Back Better" in ways that contribute to economic and social recovery while also meeting the Country's UNFCCC Nationally Determined Contributions.[114] The project will contribute to achieving the National Key Result Area (KRA) #6 on Carbon Neutrality, Climate and Disaster Resilience, #9 on Infrastructure, Communication and Public Services, and #14 on Healthy and Caring Society of the 12th Five Year Plan.

The need for crop insurance is one of the priorities identified in the Third National Communication to the UNFCCC, in Bhutan's Country Programme under the GCF[115], in the National Adaptation Plan (NAP) currently under development, as confirmed by the National Environment Commission, and in the national Food Systems Pathways developed in 2021; the project will monitor NAP discussions and synergise further where possible. Bhutan's First Biennial Update Report (BUR) to the UNFCCC is currently under development[116], as is the Long-Term Low Greenhouse Gas Emission and Climate Resilient Development Strategy (LTS).[117] Alignment with these policy statements is expected as the project directly addresses priority actions in other national climate change policy and strategy documents.

The project directly addresses post-COVID-19 challenges and priorities identified in key policies developed in 2021, namely Bhutan's Renewable Natural Resources (RNR) Strategy 2040 and the RNR Market Strategy (2021), as well as the food self-sufficiency policy priorities, the 2021 Pathways for Transformation developed for Bhutan's Food Systems, and the Low Emission Development Strategy for Food Security (2021). The LIG proposal is consistent with the RNR Sector Adaptation Plan of Action (SAPA) 2016. Through promotion of organic production and marketing, the project will further the aims of the National Strategy for Sustainable Socio-economic Development through the Commercialization of Organic Farming (2019) and the National Organic Flagship Programme (NOFP).

The gender-responsive approach of the project and the anticipated contribution to women's economic empowerment are consistent with the Gender Responsive Nationally Determined Contribution (NDC) Implementation in Bhutan, and the proposed scope of the project is aligned with the priorities of the National Commission on Women and Children, which is the nodal government agency for the protection and promotion of the rights of women and children in Bhutan, as governed by the National Gender Equality Policy 2020. The project will contribute to generating productive and gainful rural employment opportunities, in accordance with the 12th Five Year Plan, 2018-2023. The project design and all project activities will comply with Bhutan's Environmental Assessment (EA) process as an integral part of the development planning process, through enforcement of EA Act 2000.

At the sub-national level, the project will make linkages with and leverage off existing village- and gewog-level adaptation plans in which the project beneficiaries have already participated – for example, the district and sub-district level agricultural resilience plans to be developed by the BRECSA project. With respect to global goals, the project will contribute to the achievement of the following SDGs: SDG 5: Gender Equality; SDG 13: Climate Action. The project is also cognisant of the Least Developed Countries (LDC) Initiative for Effective Adaptation and Resilience (LIFE-AR); evidence of the effectiveness of microinsurance in enabling smallholder farmer adaptation generated through the project could be used to leverage for additional funding

[114] Ministry of Agriculture and Forests (MOAF), Policy and Planning Division private communication, as stated in the GAFSP proposal developed in 2021.
[115] GNHC (2019). *Bhutan's Country Work Program for Green Climate Fund.* Gross National Happiness Commission, Royal Government of Bhutan, Thimphu.
[116] http://www.nec.gov.bt/projects/details/bhutans-first-biennial-update-report-bur-to-the-unfccc last accessed 10/06/22.
[117] The proposed LTS will enhance the existing National Strategy and Action Plan 2012 taking into consideration socio-economic development, updated information and new international mechanisms to develop strategies and recommendations up to 2050. It will also encompass the vulnerability of the country to climate change and propose adaptation interventions to enhance resilience.

via LIFE-AR[118], as well as through evolving international Loss and Damage (L&D) discussions and financing mechanisms.

G. Compliance with national technical standards

The project will comply with the national Environment Assessment guidelines as well as the relevant Environment Codes of Practice. Overall, the project activities will be within the context of requirements of National Environment Protection Act 2007. Insurance and microfinance activities fall under the ambit of the national regulator, Bhutan Monetary Authority. The project will comply with all existing regulations and will assist the regulator to develop additional guidelines and standards on microinsurance that may be required.

The project will comply with the relevant national technical standards for all the adaptation activities under Component 2, which will include demonstration of climate-resilient agricultural technologies and provision of climate-resilient varieties, good agricultural practices (GAPS), conservation agriculture, and processing and livelihood diversification activities. The relevant national technical standards in Bhutan for these activities include the Minimum Seeds Standard of 2019, the Bhutan Technical Regulation for Maize and Maize Products, the General Standard for Food Hygiene, and the Guidelines for Field and Seed Inspection, as promulgated by the Bhutan Agriculture and Food Regulatory Authority (BAFRA). Activities for the promotion of climate smart agricultural practices and improvement of water governance shall further be aligned with the Land Act 2007, Bhutan Water Policy 2008, Water Act of Bhutan 2011, and the Agriculture and Land Development Guideline 2017. The organic production and marketing activities will comply with Bhutan's locally developed organic standards and certification, under the authority of BAFRA as the certification body.

The project will comply with the above and any other relevant national standards, but will also adopt best practice international guidelines, for reducing vulnerability and promoting sustainable development while addressing climate change impacts. In this regard, the AF's environmental and social standards are invaluable and will be adhered to, as is further indicated in Section II.N, and as will be set out in the project environmental and social management plan (ESMP) to be developed for the full proposal.

H. Avoiding duplication with other funding sources

There is no index-based microinsurance for smallholder farmers in the country; thus, the project will not duplicate any other funding sources in terms of the roll-out of this adaptation financing innovation in Bhutan. In order to implement index-based microinsurance at scale under the LIG through an integrated approach to rural resilience, the project will actively build upon and synergise with existing and planned interventions in the project localities. This approach will leverage and strengthen existing and planned interventions of the RGoB and development partners, thus promoting efficiency and sustainability for the LIG as well as for the relevant interventions. It is likely that one of these will be the RGoB/IFAD/WFP BRECSA project, that is funded by the GAFSP. Where the project shares geographical targeting with BRECSA, it will build upon BRECSA's climate-resilient production, value chain and marketing activities.

[118] http://www.nec.gov.bt/projects/details/least-developed-countries-ldc-initiative-for-effective-adaptation-and-resilience-life-ar last accessed 10/06/22.

Project Title Amount	Funding / Accredited and Implementing institutions	Timeframe / locations	Strategy / activities	Complementarity with proposed Bhutan WFP AF LIG / regional project
ONGOING				
Enhancing Sustainability and Climate Resilience of Forest and Agricultural Landscape and Community Livelihoods in Bhutan Amount: US$ 13.9 million	Funding Agency: Global Environment Facility (GEF)- LDCF Accredited Entity: United Nations Development Programme (UNDP) Executing Agency: Gross National Happiness Commission (GNHC)	2017-2023	Enhance institutional capacity for integrated landscape management (ILM) and climate change resilience; Biological corridor system governance and management system at pilot corridors; Provide climate resilient livelihood options for communities through diversification, SLM and CSA and livestock management supported by enhanced infrastructure; Knowledge Management and lesson sharing	The LDCF project will invest in a range of adaptation measures, including climate-resilient irrigation and road design, crop diversification; creation of biodiversity and conservation-oriented jobs, enhanced markets and market accessibility, and SLM, which will generate valuable lessons, potentially to be integrated into the final design of the AF LIG. Study was carried out on compensation insurance in 2016 for crops (climate-related and wildlife), which has been used in the insurance pre-feasibility study of the LIG'.
The Food Security and Agriculture Productivity Project (FSAPP) Amount: US$ 8 million	Funding Agency: Global Agriculture & Food Security Program (GAFSP) Supervising Entity: World Bank Executing Agency: Department of Agriculture	2019 - 2025 5 SW Dzongkhags: Chukha, Dagana, Haa, Samtse & Sarpang and in 24 of the total 58 Gewogs in the 5 Dzongkhags[119]	To increase agricultural productivity and enhance access to markets for farmers in selected gewogs in south-west Bhutan.	If there is geographical overlap with the FSAPP project localities, the AF LIG will build on and not duplicate the agricultural productivity and enhanced access to markets activities of the FSAPP.
Supporting Climate Resilience and Transformational Change in the Agriculture Sector in Bhutan Amount: US$ 58 million	Funding Agency: Green Climate Fund Accredited Entity: UNDP Executing Agency: GNHC	2020 - 2025 8 target Dzongkhags: Dagana, Punakha, Trongsa, Tsirang, Sarpang, Samtse, Wangdue Phodrang and Zhemgang	Aims to enhance the resilience of smallholder farmers through integrated climate-resilient agriculture. Includes adaptation of irrigation, soil and water management; community seed production and multiplication and cultivation of climate-resilient crop alternatives; scaling up of sustainable land management (SLM) technologies to support soil and slope stabilization; climate resilient roads for market access.	Where there is a geographical overlay of implementation localities, the AF LIG will facilitate linkages with the climate services developed under activity 1.2 of the GCF project, which is "Tailored climate information and related training to local government and farmers to interpret and apply climate risk data to local and household level agriculture planning" and includes developing climate services. The

[119] Chukha: 5 Gewogs: Bongo, Doongna, Getana, Maedtabkha and Samphelling; Dagana: 5 Gewogs: Drukjeygang, Karna, Karmaling, Lhamoi Dzingkha and Nichula; Haa: 4 Gewogs: Gakiling, Uesu, Samar, Sangbay; Samtse: 5 Gewogs: Dophuchen, Norbooganag, Sang- Ngag-Chhoeling, Tading and Tendruk; Sarpang: 5 Gewogs: Gakiling, Shompangkha, Dekiling, Samtenling and Tareythang.

Project Title Amount	Funding / Accredited and Implementing institutions	Timeframe / locations	Strategy / activities	Complementarity with proposed Bhutan WFP AF LIG / regional project
				AF LIG will not duplicate any of the activities of the GCF project, but rather will leverage off them, and provide resources to enhance their effectiveness – for example in terms of gender-responsive digital dissemination – where required.
Bhutan for Life Amount: US$ 118.3 million	Funding Agency: Green Climate Fund Accredited Entity: WorldWide Fund for Nature (WWF) Executing Agency: MoAF	2017 - 2032	To support improved management of the country's Protected Areas, providing time and resources for the government to secure long-term revenues to maintain the improvements.	There is no overlap with the proposed AF LIG.
Strengthening Risk Information for Resilience Amount: US$ 3.51 million	Funding Agency: World Bank, Japan, EU Executing Agency: Department of Disaster Management; Department of Agriculture; National Center for Hydrology and Meteorology; Ministry of Works and Human Settlement	2022 – 2025 MHR-DSS: nationwide coverage 11 gewogs for agro-met advisories:	Will generate nationwide multi-hazard risk assessment, focusing on high-risk hazards (earthquakes, floods and landslides); and develop web-based & mobile applications on climate/disaster risks. Will provide agro-met advisories to 5,140 households in 11 gewogs, by increasing the Agromet Decision Support System's weather forecast range from 3 days to 10 days, to enhance pest advisories and disease forecasting. Includes Climate Field Schools for farmers; and using drones to undertake a detailed survey of landslide hotspots along road networks.[120]	The scope of the AF LIG will go beyond that of the WB/Japan/EU-funded project, to include a wide range of risks facing smallholder farmers and may include increased heat and heatwaves. Drought, heavy rainfall, flooding, hailstorms, heavy winds, etc. The AF LIG will build on and strengthen the DS for MHR, and, where there is geographical convergence, will leverage and strengthen where necessary the system of agro-met advisories developed.
Strategic Program for Climate Resilience (SPCR) Amount: US$ 1.5 m (PPG)	Funding Agency: Climate Investment Fund (CIF) Accredited Entity: GNHC Executing Agency: GNHC		Water security focus. Preparedness to risk posed by GLOFs and climate induced disasters including flash flood-assessment of flood hazards Hydro met modernization, 04 long term studies & curriculum development	No duplication with the AF LIG.
Commercial Agriculture and Resilient Livelihoods	IFAD	2015 – 2025 Six eastern districts, plus four districts in	Focuses on marketing and climate resilient farming practices. Included a home-grown school feeding approach.	The AF LIG will not duplicate but will build on the marketing and climate resilient farming practices of CARLEP where there is geographical overlap, as described

[120] https://www.worldbank.org/en/news/press-release/2021/12/10/world-bank-supports-bhutan-to-strengthen-climate-and-disaster-resilience

Project Title Amount	Funding / Accredited and Implementing institutions	Timeframe / locations	Strategy / activities	Complementarity with proposed Bhutan WFP AF LIG / regional project
Enhancement Programme (CARLEP)		the central and southwest		under Component 1 and Component 2 of the LIG.
Bhutan: Rural Finance Development Project Amount: US$ 20 m concessional loan + TA	Funding Agency: ADB Executing Agency: Department of Macroeconomic Affairs, Ministry of Finance	2020 – 2025 Nationwide	Focus is on enhancing access to finance for rural cottage and small industries (CSIs), to increase rural employment and promote economic development, by (i) expanding collateral-based rural CSI financing through Bhutan Development Bank (BDB), Bhutan's key rural finance intermediary; (ii) extending, through BDB, non-collateral-based group loans to rural CSIs that lack assets; (iii) strengthening BDB's institutional capacity, including enhancement for rural CSI financing operations; and (iv) providing financial literacy training and business development support to rural CSIs, in particular CSIs owned by small and marginal farmers and women.	The AF LIG will leverage off the activities of the ADB-funded project, to promote access to rural finance opportunities for the LIG project beneficiaries. Linkages will be facilitated for project beneficiaries to the financial literacy training and the appropriate rural financial products.
UNDER PREPARATION				
Building Resilient Commercial Smallholder Agriculture (BRECSA) Amount: US$ 13 million + US$ 8 = US$ 21	Funding Agency: GAFSP and IFAD Executing Agency: Ministry of Agriculture and Forestry (MoAF) Supervising entities: IFAD and WFP	2023 – 2027 Central and central-south dzongkhags: Zhemgang, Trongsa, Tsirang, and Sarpang	Commercialisation of agricultural value chains toward resilient food systems and post-COVID economic recovery in Bhutan. Includes capacity building and investment support to small-holder farmers on production, marketing, and better access to services (technical, financial, and business) for engaging in profitable value chains as vegetables, dairy, livestock, poultry and high value crops (herbal, aromatic, medicinal and spices). SLM / GAPS technologies include permaculture. Will enhance production of nutri-cereals for food diversity (wheat, buckwheat, millets and quinoa); and includes actions to manage human-wildlife conflict. Will develop multistakeholder district and sub-district level agriculture resilience plans. Creation of youth farmer network. Market access infrastructure and linkages.	The AF LIG will leverage on BRECSA's support to production and climate-resilient and nutritious value chain development and marketing, and thus geographical convergence will be developed. Where the LIG's microinsurance activities are implemented in the BRECSA dzongkhags, this will provide a risk transfer mechanism that enables integrated resilience building. The specific entry points and modalities will be further developed during full proposal development and project inception phase. BRECSA will include WFP's Consolidated Livelihood Exercise for Analysing Resilience (CLEAR); as this will cover the entire country, the LIG will make use of the disaggregated livelihoods and climate risk information in detailed design during the development of the full proposal, if the CLEAR has already been completed by

Project Title Amount	Funding / Accredited and Implementing institutions	Timeframe / locations	Strategy / activities	Complementarity with proposed Bhutan WFP AF LIG / regional project
				then; as well as in local level planning and implementation of the LIG. BRECSA includes extending the reach of digital financial products and services to women; this will be directly leveraged through geographical convergence with the LIG implementation dzongkhags.
Adaptation to Climate-induced Water Stresses through Integrated Landscape Management in Bhutan Amount: US$ 9,95 million	Funding Agency: Adaptation Fund Accredited Entity: Bhutan Trust Fund for Environmental Conservation Executing Agency: DLG, National Soil Center, MoWHS, MoAF	CN approved; FP submitted but not yet approved 2 dzongkhags (Dagana and Paro)	Watershed Management, Irrigation and Drinking Water Supply project (infrastructural developments for water accessibility). Will *inter alia* support the upscaling of PES schemes in project dzongkhags. Output 3.2 will "support the roadmap of agro-met services in Bhutan for better climate informed digital advisory services", with CS packaged end-to-end with other project activities.	It is understood that the climate services activities planned under Output 3.2 of the BTFEC project may be excluded from the final FP to be submitted to the AF. If this is not the case, and, where there is geographical convergence, the AF LIG will leverage and strengthen where necessary the system of agro-met advisories developed.
Advancing Climate Resilience of Water Sector in Bhutan (ACREWAS)[121] Amount:	Funding Agency: GEF- LDCF Accredited Entity: UNDP Executing Agency: Ministry of Works and Human Settlement	At preparation stage Gasa, Punakha, Wangduephodrang, Tsirang	Primarily concerned with water governance, nature- based solutions for sustainable and climate- resilient watersheds,and climate-proofing water supply infrastructure.	No expected duplication with any proposed AF LIG activities. This will be confirmed once the project concept is available/
Enhancing Climate Resilience of Water Sources in Bhutan Amount: US$ 20 m	Funding Agency: GCF Accredited Entity: FAO Executing Agency: MoAF	At preparation stage 6 districts: Haa, Bumthang, Trashiyangtse, Lhuntse, Sarpang, Chhukha	Primary focus: irrigation and drinking water, emphasising springs and spring sheds. Will collaborate with NCHM on improving weather data for Impact-based forecasting on pests etc. Will also work on improving yields and post-harvest loss at HH level.	Should there be a geographical overlap, the LIG will leverage off the climate services activities of the GCF project and provide additional resources to enhance these e.g. with respect to gender-responsive digitalisation. Synergies will be sought with the production and PHL activities.

[121] https://www.thegef.org/project/advancing-climate-resilience-water-sector-bhutan-acrewas

I. Learning and knowledge management

Learning and knowledge management in the project will be tailored to support innovation substantiated through evidence generation, in partnership with research institutions. To promote systematic learning and dissemination of this, the project will develop and implement a learning and knowledge management (L&KM) strategy.

Guided by the L&KM strategy, the project will develop targeted knowledge and use this to enable and scale up an evidence-based approach to institutionalising the project's innovative approach to climate risk management. Output 1.2.3 will focus on developing the project's L&KM strategy and on designing a feedback loop for learning from a range of activities that take place on the ground. This will include the feedback loop to continuously improve the insurance product, which will include *inter alia* feeding back the daily rainfall data on a monthly basis to the project management unit, as well as National Centre for Hydrology and Meteorology (NCHM) and the Department of Agriculture. Lessons learned from the insurance customer journey study will also be consolidated and appropriately disseminated under the L&KM strategy. The L&KM strategy will include appropriate knowledge products to be developed where necessary – for example, policy briefs that describe the process of rolling out the microinsurance in Bhutan, and on the role of multistakeholder partnerships in enabling the creativity of Bhutan's innovators to have a greater impact on rural resilience and adaptation to climate change.

As noted under Part II.B, rolling out the primary innovation of microinsurance will be carried out in a way that promotes integration of secondary, local-level innovations that have demonstrated effectiveness in the project localities, thus leading to new knowledge and practice on innovation for rural resilience in Bhutan. This process of integration between the primary mature innovation of index-based microinsurance with secondary Bhutanese innovations will be carefully documented so that the new knowledge developed can be shared more broadly, and evidence generated to substantiate its effectiveness. This innovation process will include building on traditional and cultural knowledge and practices, for example to strengthen dissemination of targeted and localised climate services. These elements will also be carefully documented for further dissemination.

The project will include activities to support dialogues on innovation between research organisations and climate-vulnerable communities to engender action as well as a sense of hopefulness in rural areas with empty households and high youth unemployment. Finally, the project will ensure that good practices and lessons learnt from promoting gender equality evidenced through the project are shared effectively and continuously amongst stakeholders, and that these inform policy/decisions at national and local levels.

J. Consultative process

The project team adopted a participatory approach to the development of the Concept Note, which included four national-level stakeholder consultation workshops, a series of bilateral consultations with a range of stakeholder groupings, six community consultations meetings held in three dzongkhags, and a final focused validation workshop. The consultations aimed to understand the key policy priorities and programmes of the RGoB in responding to climate change, key climate risks facing smallholder farmers in Bhutan, their coping responses and adaptation needs, the available services for enhancing the resilience of smallholder farmers and gaps in these services, as well as the opportunities and challenges facing the insurance ecosystem in the country. The findings of the consultations have been used to shape the outcomes and outputs of the CN, in order to overcome identified barriers. In addition, a multi-stakeholder validation process was convened by the GNHC to validate the final draft of the CN prior to submission to the AF.

Five national-level stakeholder consultation workshops were held at important stages in the development of the Concept Note:

- An initial multi stakeholder consultation was held in Punakha between September 28 – 29, 2021 led by the Gross National Happiness Commission (GNHC), as the Designated Authority to the AF of the RGoB for the Large Innovation Grant (LIG). The objectives of the workshop were to (i) provide background on the proposed AF LIG; (ii) discuss and agree on the focus for the LIG project; and (iii) agree on the stakeholder and community consultations process for the LIG. The workshop generated 11 possible innovation focus areas to consider, including both local innovations and those from other countries/regions. Additional analysis after this workshop resulted in the prioritisation of climate risk management through index-based microinsurance for smallholder farmers as the preferred innovation, as described in Part II.K below.

- A second multi-stakeholder consultation was held in Thimphu on 29 October 2021 to investigate in more detail the status of crop insurance in Bhutan, including challenges faced by farmers and those attempting to institute insurance schemes. The objectives of the workshop were to: (i) better understand the needs of crop insurance in Bhutan and; (ii) present WFP's integrated approach to weather-index insurance as a potential solution to Bhutan's challenges. This workshop was mainly focused on the agriculture sector.
- A third multi-stakeholder consultation was held in Thimphu on 15 June 2022 to present the framework of the proposed project and to agree the project components, outcomes and outputs. In addition, WFP provided a recap of the AF criteria, the process undertaken to date to develop the CN, and next steps. There was general consensus from participants that the project goal and objectives were correct and are in line with the policy priorities of the RGoB and with the needs of vulnerable farmers on the ground. The participants also agreed on the project outcomes and outputs as presented.
- A fourth multi-stakeholder workshop, mainly focused on the insurance sector, was held in Thimphu on 23 June 2022 to present and discuss (i) a summary of findings from the various consultations held with communities, relevant agencies of the RGoB, insurance companies, banks and rural microfinance institutions; and (ii) types of insurance available in the market, key characteristics and their suitability for Bhutan's context.
- A multi-stakeholder validation workshop was held in Thimphu on 20 July 2022, to validate the draft CN prior to its submission to the AF. This was attended by participants from the RGOB, insurance companies, micro-finance institutions, the NIE for the AF (Bhutan Trust Fund for Environmental Conservation), and WFP.

Please see **Annex 2** for further detail on these workshops, including the participating stakeholders.

In addition to the stakeholder workshops, bilateral consultations were conducted to better understand the ongoing programs and projects and roles of agencies relevant to index-based micro-insurance. These agencies include government agencies: DoA, Gross National Happiness Commission (GNHC), National Centre for Hydrology and Meteorology (NCHM), National Commission for Women and Children (NCWC), National Environment Commission (NEC); Royal University of Bhutan (RUB) (College of Natural Resources (CNR), development partners: Bhutan Trust Fund for Environmental Conservation (BTFEC), United Nations Development Programme (UNDP), and Food and Agriculture Organization (FAO); banks and corporations: Royal Insurance Corporation of Bhutan (RICB), Bhutan Development Bank Ltd. (BDBL), National Development Cottage and Small Industry (CSI) Bank Ltd), Bhutan Insurance Limited; civil society organizations: Youth Development Fund (YDF); cooperatives: Agro-Logistics Marketing Cooperative; and private sector/ microfinance: RENEW (Respect, Educate, Nurture and Empower Women) Microfinance and Tarayana Microfinance.

Some key points raised by stakeholders for consideration in the project design are: (i) There are high levels of interest in crop insurance as a potential solution for reducing the risks faced by the farmers, it is a policy priority of the RGoB but an earlier attempt to initiate this with RICB was not implemented due to technical considerations and the unaffordability of a government subsidy of the premium, exacerbated by the decline in the economy related to the COVID-19 pandemic; (ii) post-harvest loss, irrigation, shortage of labour, and wildlife damage to crops are highly significant issues; (iii) there are concerns about the continually reducing number of people engaging in agriculture; (iv) there are challenges with providing accurate localised agro-meteorology services due to Bhutan's terrain and multitude of micro climates; (v) organic production is a policy priority and certification of organic farms started in 2018 by Bhutan Agriculture and Food Regulatory Authority (BAFRA), a challenge is the availability of bio-fertilizers and bio-pesticides; (vi) the DoA's recommendation is to start insurance of commercial crops such as potatoes, vegetables, chillies, tomatoes, oranges and apples, cardamom, organic cherry, strawberries, quinoa, etc.; while rice is the most important part of Bhutanese diet, it is not highly commercial; (vii) while a number of initiatives have supported this, the understanding of climate smart agricultural technologies on the part of farmers and even extension officers is quite shallow; (viii) climate suitability maps have been developed with CIAT for major commodities, including quinoa; this was done several years ago but there is very little discussion or focus on this; (ix) the main climate change-related risks are: excess rain/incessant rain, flash floods, landslides triggered by rain, windstorms, tropical storms, glacial lake outburst floods, drought and dry spells, and outbreaks of new pests and diseases; (x) affordability of crop insurance is a major concern; it will be important to include far-flung rural areas as they are significant affected

by climate risks as well as human-wild life conflict; (xi) economy of scale is a challenge in Bhutan considering its small population; (xii) there is a need for insurance in the eastern parts of the country which are very dry and lack development interventions.

The meetings with the National Commission for Women and Children (NCWC) and the Youth Development Fund (YDF) were particularly important as women and youth have been identified as two of the more vulnerable groups to the impacts of climate change in Bhutan. Some specific issues raised by these two organisations were: (i) there is a strong linkage between emerging challenges with climate change and disasters and increase in poverty which is directly affecting women and children, and there is not much in place to address these challenges – thus, innovative ideas are required; (ii) financial literacy trainings and awareness programmes are required, the illiterate portion of the population should not be left behind with the push to digitalization leading to a digital divide; (iii) projects should also be child responsive - with increasing responsibilities of women in agriculture, children are exposed to higher risks e.g. harsh weather and higher risk of child abuse; (iv) strong need to set up child care facilities when trainings are conducted so that women can participate comfortably; (v) when prioritizing crops, in addition to the commercial values, nutritional values should be considered as well to ensure economic benefits come without compromising on health benefits; (vi) a key challenge with engaging youth in farming is the need for continuous funding and training and technical support for longer periods, and there are good examples e.g. the Panbang Youth Cooperative for farming; (vii) the YDF has established the My Gakidh Village, the first of its kind in Bhutan with the goal of curbing rural-urban youth migration by providing sustainable livelihood skills and opportunities, and includes a natural (organic) farming youth cooperative in Toebesa village, Punakha dzongkhag, among others; under a rehabilitation program, YDF has established Young Farmers Groups in 18 gewogs.

The national and bilateral stakeholder consultations included a total of 77 people, of which 20 were women. **Annex 3** contains a list of all stakeholders consulted at the national level.

Six sets of community consultations were carried out between April and June 2022 in six gewogs (blocks), two gewogs each in Paro, Punakha, and Dagana dzongkhags. While the intention had been to cover a broader range of gewogs, repeated delays in carrying out the community consultations due to numerous COVID-19 restrictions and lockdowns led to these gewogs being selected by the DoA based on what was feasible. The objectives of the consultations were to better understand the basis of livelihoods of the farmers, their challenges in the agriculture sector, perceived impacts of climate change, their responses and coping strategies, access to climate services and finance, and understanding of insurance. The community consultations included 80 men and 56 women in total, and included representation from all segments of the communities, including the poorest and most vulnerable households. The Gewog Agriculture Extension Officers of the DoA took the lead in organising and facilitating the consultations, guided by the WFP project team. For consistency, each community received the same set of questions, focused on their livelihoods, perceptions of climate change, roles and responsibilities of community members, and adaptation needs.

The main climate change-related risks faced by farmers in these gewogs are heavy rainfall, drought, hailstones, windstorms, heavy snow fall, and outbreaks of new pests and diseases; other risks to smallholders which may have climate-related causes are wild animals, birds and rodents. Many farmers remember changes in rainfall patterns from about more than a decade ago. The main support for agriculture advisories comes from the Extension Officers of the Ministry of Agriculture and Forests, while additional support is sought from elder farmers. The main sources of income of the farmers include sale of crops, vegetables, and fruits. The dominant crops, vegetables, and fruits are (i) in Paro: potatoes, wheat, paddy, cabbages, chillies, beans and apples; (ii) Punakha: paddy, wheat, mixed vegetables, and apples; and (iii) Dagana: cardamom, maize, mandarin, mixed vegetables, and paddy. Farmers also earn additional income from sale of non-wood forest products and livestock products (butter, cheese, milk, and manure) and wages from construction works. Women are in higher demand for planting than men since in general women are more skilled at this task. In case cash is paid for labour, for agricultural works, the rates for men and women are in the same range.

Coping mechanisms include the installation of electric fences against wild animals, using hybrid seeds which are drought tolerant, and use of chemical sprays to protect from pests and diseases. Some of the issues raised during the community consultations were: (i) farmers are aware of increased frequency of extreme weather events, but they do not have data or are unable to quantify impacts and the losses they experience; (ii) farmers have issues with marketing supply chain that makes it difficult to sell products even in good years; (iii) farmers highlighted how forecasts are not always reliable, some use the daily forecasts for short term decisions but

there is clearly a need for reliable, longer-term weather forecasts to support better planning of farm activities; (iv) there is awareness of insurance and interest in better understanding how weather index insurance would work, and an expressed demand for better crop insurance; (v) human-wildlife conflict is as a significant challenge faced by famers.

A gender assessment was conducted in March 2022 to provide an overview of gender issues in Bhutan in the legal and socio-cultural context, highlight differentiated gender impacts of climate change specific to agriculture and smallholder farmers in Bhutan, and to provide gender-specific recommendations for how the project could address these identified risks and increase the resilience and adaptive capacity of women and all groups in an equitable and effective fashion. Collection of primary information and data in the field was not possible due to the stringent lockdown and travel restrictions imposed by the RGoB after the Omicron outbreak of the COVID-19 pandemic. Thus, information and data were gathered extensively from secondary sources and studies conducted on the gender-climate-agriculture nexus in the Bhutanese context by National Commission for Women and Children (women's machinery in the country) and international organizations. The findings of the Gender Assessment have been integrated into the design of the CN, as have the key recommendations, which can be summarised as: (i) Recognize and support **women's under-valued contributions** to household and community livelihoods which is an important strategic element to build household and community resilience; (ii) Support **empowerment and leadership-building of rural women**, and facilitate rural men to support women's empowerment, leadership, voice and participation; (iii) Project to **target more women than men (60:40); especially female-headed households** that are more food insecure; (iv) Promote **inclusive, active and meaningful participation of female farmers** in all activities, **including during the insurance feasibility assessment** and prototype testing of the index insurance, so that they are equally and effectively consulted; (v) NRM / climate-smart agriculture activities should be gender-inclusive and **designed to reduce or at least not increase women's** workload; (vi) Ensure **rural women's equitable access to index-based microinsurance** since limited access to credit and finance is one of the major challenges constraining rural women; and (vii) include a **gender-specialist** with adequate gender knowledge in the local context throughout project implementation. Please see **Annex 1** for a more detailed summary of the Gender Assessment.

K. Multiple perspectives on innovation

Multiple perspectives on innovation were first canvased at the initial stakeholder workshop held on 28 - 29 September 2021, in Punakha, Bhutan, as described in Part II.J. The workshop brought together a diverse range of relevant stakeholders, including the GNHC, MoAF, District Agricultural officers, and planning officers from the districts. Through a two-step participatory process, the participants identified a long list of 11 possible innovation focus areas to consider for the LIG, which included both local innovations as well as innovations from other countries / regions.

A systematic approach was adopted for a preliminary screening of the 11 identified options, using criteria that included the climate risks addressed by the innovation; the AF LIG innovation criteria; RGoB policy priorities; WFP comparative advantage; and whether the proposed intervention would duplicate existing or pipeline programmes/projects. Five of the 11 proposed focus areas definitively did not meet the AF LIG criteria and four were not deemed to be sufficiently innovative or clearly duplicated other existing and planned interventions. Further discussions between key stakeholders, including GNHC, MoAF, and WFP resulted in the prioritisation of climate risk management through index-based microinsurance for smallholder farmers as the preferred innovation. This innovation focus was further discussed and validated through discussions with a broader range of stakeholders, including through the community consultations process and interrogated in the findings of the gender assessment. These further discussions to seek additional points of view and validate and fine-tune the identified innovation priority resulted in valuable additional perspectives on innovation being integrated into the project concept, including that the project should be designed to embrace the integration of secondary innovations from the grassroots level and from innovative extension practices, as described in Part II.B.

The project team additionally received inputs from the WFP Innovation Accelerator (IA), which sources, supports and scales high-potential solutions to end hunger worldwide, regarding potential support in the roll-out of the project's innovation strategy. The IA can provide added value through scaling up of the innovation of index insurance, by sourcing, qualifying and scaling up the best available technology-based solutions to accelerate for example the payout process, as well as the transparency the microinsurance, and is actively seeking innovative solutions through the WFP Innovation Challenge 2022 to enhance specific elements of WFP's microinsurance process, such as monitoring systems for insurance products and indexes to increase

transparency of the end-to-end process for all stakeholders.[122] Additional discussions will be held with the IA during full proposal development in terms of sourcing, qualifying, and scaling up tech-based solutions for enhancing and scaling up microinsurance delivery in Bhutan.

Discussions were held during the CN development with Bhutan Trust Fund for Environmental Conservation (BTFEC), which is accredited as a national implementing entity of the AF and has recently received a grant of USD 250,000 from the AF Small Innovation Grant facility. This is being used to conduct a study on the innovation of bio-pesticides for Giant African Snails, over a five year period. The study will validate trapping systems and develop strategies to eradicate this pest and raise awareness of the farmers. The LIG will ensure that all synergies are captured between the innovation process carried out under this small grant and the LIG activities and will involve the BTFEC closely in the development of the full proposal to achieve this end.

Additional fruitful discussions on enhancing the primary innovation have been held with research and academia, in the form of the Research and Extension Division of the DoA, including the NCOA of the DoA, and the College of Natural Resources (CNR). The CNR has recently completed a study on progressive farmers in Bhutan that highlights additional lessons and innovations that could be integrated into the full project design, which will also include activities to support dialogues on innovation between research organisations and climate-vulnerable communities to engender action as well as a sense of hopefulness in rural areas with empty households and high youth unemployment.

Finally, the project team has had discussions with Tarayana MFI, which was recognized as one of the winners in the Climate Innovation Challenge organized by the Asian Disaster Preparedness Center (ADPC) in 2021. This challenge aimed to crowdsource innovative and disruptive technology solutions from around the world for resilience in South Asia. Through this challenge, Tarayana MFI developed an inhouse application for loan appraisal in collaboration with Gasa Dzongkhag which cuts down the appraisal time by 50 percent. This innovation is expected to be incorporated into the roll out of microinsurance under the LIG.

L. Full cost of adaptation reasoning

Component 1

Baseline scenario: Bhutanese smallholder farmers, who are increasingly women, face a range of challenges and barriers in increasing their agricultural production and incomes, and diversifying their livelihoods so that they are more climate resilient. Smallholder farmers who rely mainly on rain-fed agriculture are already affected by unpredictability in the timing of monsoons, and localised water shortages and prolonged drought in some areas.[123] At the same time, farmers, especially women who predominate in the agricultural sector, lack a credible risk transfer mechanism such as affordable crop insurance that could prevent them from resorting to negative coping strategies, and have insufficient access to the climate-resilient agricultural approaches, technologies and finance that they could harness to enhance the resilience of their agriculture-based livelihoods and address the climate impacts already experienced, and prepare for the future climate risks. Under the baseline scenario, it is likely that the increasing trend of migration out of rural areas and of 'empty households' will continue, with negative effects on household and national food security, as well as on social and cultural wellbeing.

Additionality: Under the project, smallholder farmers of whom at least 70 percent will be women will gain increased understanding of current and future climate risks and be able to address these through enhanced access to climate-resilient agricultural approaches and technologies targeted to their livelihoods, such as GAPs, conservation agriculture and organic production. They will be sensitised on the benefits of index insurance and supported and incentivised to adopt this through coverage of the premium on a decreasing scale through the project's graduation strategy. Smallholder farmers will be supported to take more climate risk informed decisions through enhanced access to more targeted climate services and participation in coherent adaptation planning processes, informed by WFP's CLEAR, which is a robust spatial and temporal climate vulnerability and risk assessment. Climate champions (lead farmers and farmer groups), the majority of whom will be women, with a focus as well on youth, will be empowered to serve as advocates for further uptake and scaling out of the prioritised innovation of index insurance, as well as the integrated resilience building approach through which the insurance will be delivered. All of these activities will deliver social, economic and

[122] https://innovation.wfp.org/apply last accessed 04/07/22.
[123] RGoB and World Bank (2015) Modernizing Weather, Water and Climate Services: A Road Map for Bhutan.

environmental benefits as set out in Part II.D and contribute to the revitalisation and increasing climate resilience of Bhutan's rural areas and agricultural economy.

Component 2

Baseline scenario: There is currently no index-based microinsurance programme for smallholder farmers in Bhutan. In the context of increasingly frequent climate shocks such as heavy rainfall events and droughts, smallholder farmers' risks for total crop failure are increasing, resulting in them having to sell productive assets to cope. Such negative coping strategies are leading to loss of land in some cases and to the situation of 'empty households' and 'empty fields' in the rural areas. The increasingly difficult situation in the rural areas, in which the productivity of smallholder agriculture is declining due to climatic changes and the lack of adaptation support, is also fuelling migration into the urban areas, especially of men and youth. This is leading to labour shortages, the increasing feminization of agriculture in Bhutan, reduced social cohesion of the rural areas, and lower human capacity to re-energise rural economies. Access to affordable credit for agriculture-related activities continues to be a challenge for the rural community, and for women in particular; thus even those people who are remaining in rural areas are not able to access credit to fund their own adaptation activities. Even if they have been supported by a climate change project, as soon as the project ends, they fall back on negative coping strategies. Furthermore, there are few incentives to energise and encourage rural youth and women to excel as resilient rural entrepreneurs and continue investing in their areas and serving as champions and change agents for climate response options.

Additionality: With support from the AF, risk transfer will be enabled through rolling out index-based microinsurance in the targeted project areas, with the poorest farmers 'paying' for the crop insurance premium through the conditionality of sustainable agricultural practices, such as conservation agriculture, GAPs and organic production. Rapid compensation for weather-related losses will build resilience, as farmers can avoid selling productive assets and recover faster from climate shocks such as floods and droughts. Furthermore, helping farmers to access micro credit and savings allows for ongoing and sustainable livelihood diversification, as an adaptation strategy, and helps farmers to build up their risk reserves. Increasing savings and access to micro finance means that poor smallholder farmers will be empowered to invest in their own chosen actions for post-harvest storage and processing, and thus be able to move up the value chain. Thus, vulnerable farming households will continue to develop their income generating activities and livelihoods diversification, thus building their adaptive capacity and enabling ongoing adaptation actions on their part. Incentives will be developed to energise rural youth and women to become climate champions, thereby furthering the dissemination of project activities.

Component 3

Baseline scenario: In the absence of the dedicated activities to institutionalise the project's innovative approach to climate risk management through rolling out index-based microinsurance, the impact of the project will be limited to the targeted localities and beneficiary groups. Without these additional actions, the insurance ecosystem may not receive sufficient support to be robust and sustainable going into the future.

Additionality: Through the activities under Component 3, the project will develop capacities and mechanisms to promote the further scaling up of the activities beyond the project localities, with the aim of ultimately covering all 20 dzongkhags of Bhutan, as well as a broader range of livelihood systems and groups. This will result in a greater impact for the project's actions and greater benefits for more smallholder farmers across Bhutan from risk transfer through microinsurance, as well as a strengthened and better supported insurance ecosystem.

M. Sustainability

A key theme running through the project logic is for evidence-based and systematic approaches that build systems for sustainability and further scaling out.[124] The approach to rolling out the primary innovation of index-based microinsurance, which is through an integrated risk management and resilience building approach, is fundamentally designed to promote sustainability – and has been demonstrated to promote that, through numerous similar WFP-supported programmes.

[124] The project will also ensure that it avoids an ad hoc approach and supports the building of long-term institutional systems and programmes in Bhutan, including with respect to implementing the 12th Five Year Plan, the 21st Century Economic Roadmap, the National Climate Change Policy, the National Adaptation plan (NAP) under development, etc.

The insurance graduation strategy is an important element in the project's sustainability strategy. For sustainability, the initiative incentivises participants to register for microinsurance through risk reduction conditionalities (e.g. climate resilient agricultural technologies, GAPs, organic production) and simultaneously enhances participant's saving capacity and access to loans while gradually enabling farmers to pay for a portion of the insurance premium. The inclusion of increased access to micro-finance and savings is designed to help smallholders create a sustainable source of income they can use to pay for their weather-index insurance. A critical part of the sustainability strategy is the development of an effective distribution strategy, to ensure farmers can access insurance when they wish. This entails establishing an insurance ecosystem for accessible, affordable and beneficial microinsurance.

The climate risk informed approach to selecting project localities and appropriate value chains, including through the CLEAR tool will help to identify major impacts of climate change, most vulnerable communities and inform adaptation measures suitable for particular locations, which will be crucial for avoiding maladaptation and facilitating the sustainability of the diversified livelihoods the project will promote.

In order to implement index-based microinsurance at scale under the LIG through an integrated approach to rural resilience, the project will actively build upon and synergise with existing and planned interventions in the project localities. This approach will leverage and strengthen existing and planned interventions of the RGoB and development partners, thus promoting efficiency and sustainability for the LIG as well as for the relevant interventions.

A further central component of the project's exit strategy is the multi-pronged gender mainstreaming approach to advance gender equality for sustained results and climate resilience. The key components of the project's gender strategy, namely equitable participation in benefits and in decision making of women and female youth; and targeting specific activities to benefit women and female youth equitably, will contribute to sustainability by building their social and economic empowerment, the lack of which is still a constraint to development in Bhutan. Key steps will include: (i) designing activities and initiatives to be gender-inclusive and designed as to reduce or at best not increase the workload of already over-burdened and time-deprived rural women; (ii) since one of the major gender issues impacting women is the prevalence of GBV, the project in collaboration with the NCWC and/or RENEW MFI should conduct awareness and sensitization program on GBV and its impacts for women; (iii) the project will consider including a gender-specialist with adequate gender knowledge in the local context to provide advice within the project and ensure gender equality and responsiveness throughout; (iv) the project's progress, impacts, and benefits will be monitored and assessed using gender-disaggregated data and gender specific indicators; (v) gender transformation will be measured during/after the project, using the 'Women's Empowerment in Agriculture Index (WEAI)' tool that measures changes associated with the root causes of gender inequality especially in agriculture.

N. Environmental and social impacts and risks

The entire project was put through a preliminary screening for environmental and social risks against the 15 principles outlined in the AF's Environmental and Social Policy, as set out in the table below. The project is not expected to generate any significant environmental/social impacts or risks. Component 1 of the project entails facilitating linkages to climate services and enhancing access to climate resilient agricultural technologies such as conservation agriculture and organic production, supported by GAPs, as well as empowering women and youth climate champions. Component 2 activities will develop financial incentives and risk transfer mechanisms for sustainable resilience building and adaptive capacity developing, while Component 3 activities will institutionalize the innovative approach to climate risk management through index-based microinsurance. These are intrinsically risk-averse with respect to social and environmental impacts. The specific crops to be promoted through the climate-resilient and nutritious value chain development will be identified during full proposal development. This identification process will be informed by the best available crop suitability assessments under the changing climate, as well as WFP's CLEAR tool.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law		**Low/no risk**: The CN has been developed to be in compliance with the legal frameworks of Bhutan. Relevant national, regional and district authorities have been consulted during CN development and will continue to be consulted during full proposal development to ensure compliance with all relevant laws.
Access and Equity		**Low/moderate risk:** The project is designed to promote the equitable access to activities and assets by women and youth in project areas. Project activities are not expected to lead to changes in tenure arrangements as such. However, economic benefits from the project could potentially put groups or individuals at a disadvantage or lead to disagreements and minor conflicts, including on land tenure arrangements. Project activities to enhance access to microinsurance and microfinance will result in enhanced livelihoods diversification for the most vulnerable HHs. The project will put in place adequate measures to ensure equitable access to activities and assets by women, youth and vulnerable groups in project areas. Further in-depth consultations with communities and stakeholders will be conducted throughout proposal development and project implementation to ensure that any barriers to access and equity can be overcome in line with the AF's ESP.
Marginalized and Vulnerable Groups		**Low/no risk**: There are no displaced people or official refugees in the country. The project targeting approach ensures that marginalised and vulnerable groups (primarily women farmers and households headed by women, as well as rural youth) will be afforded due consultation during the remainder of the project design phase and will do the same during implementation. The activities to be implemented under all components (particularly under Component 2) aim at: i) empowering vulnerable groups to make informed adaptation decisions, thus decreasing vulnerability to climate-related impacts while taking into consideration their traditional and local knowledge; ii) increasing availability, quality of and access to resources of marginalized groups. Concrete adaptation and value chain activities will be supported in which both women and men can participate, as well as female and male youth. The project will also implement climate resilient and nutrition-sensitive value chain support targeted to improve the nutritional status of poor people and vulnerable groups. Further guided by the Gender Assessment, the ESMP will set out key measures in this regard. No additional disproportionate distribution of adverse impacts is expected for the marginalized and vulnerable subgroups in this project.
Human Rights		**Low/no risk**: The IE and its partners affirm the fundamental human rights of all people. The project and its intended activities do not risk violating any pillar of human rights.
Gender Equity and Women's Empowerment		**Low risk:** The project prioritises women, who form the majority of smallholder farmers in Bhutan, as the primary beneficiaries and will further mainstream gender as set out in Part II.M. The project will ensure that women, men, and female and male youth can equitably engage in and benefit from project activities such as provision of microinsurance and climate-resilient value chain development. The project's gender mainstreaming strategy is a central element of the exit strategy, and is set out in Part II.M, and will be further elaborated during full proposal development. A gender assessment has been conducted and women and women's groups have been consulted during the community and stakeholder consultations, and will be more intensively consulted during both the detailed design and implementation phases of the project. The Gender Assessment recommendations have been integrated into the CN and will inform the implementation phase. Factors influencing the discrimination against women in terms of land ownership are not expected to pose any risks in Bhutan, in view of the migration out of the rural areas and as women's ownership of land is relatively equitable in many parts of the country.

Core Labour Rights		**Low/no risk:** The IE and its partners respect international and national labour laws and codes, as stated in WFP's policies. In particular, WFP has a zero-tolerance policy for child labour of children below 14 years. Child labour is not common in the targeted areas. Avoidance measures: - Zero tolerance for child labour of children below 14 years; - Promote school attendance.
Indigenous Peoples		**Low/no risk:** Although Bhutan is populated by different ethnic groups, these are not specifically associated with a territory on which they depend exclusively, and there is generally minimum inter-group friction. The project will not discriminate against any group and will ensure the widest participation from all different groups during all of its phases, from the design to the implementation.
Involuntary Resettlement		**No risk:** The project is not expected to lead to involuntary resettlement, neither in physical nor economic terms.
Protection of Natural Habitats		**Low/no risk**: By implementing conservation agriculture and organic production, as well as GAPs, the project will ensure the protection of natural habitats. The activities of Component 1 are designed to enhance knowledge and awareness on climate change and to implement climate-resilient agricultural technologies and promote organic production. The activities of Component 2 will build financial incentives and risk transfer mechanisms for sustainable resilience building and adaptive capacity. As a result, the project's activities are not expected to have any adverse impact on the environment or natural habitats. Some activities of Component 1, such as those related to agricultural practices, could potentially have adverse impacts on natural habitats, but they will be designed in such a way that their environmental impact is minimal (building upon features of the environment that are already present, without introducing new elements or alien crop/plant species). Moreover, these activities are of small-scale (managed at individual, household, or farmer group level) and any residual impact on the environment or habitats would be negligible and readily remediable. **Avoidance measures**: - No introduction of alien crop/plant species; - No activity in conservation areas and/or natural reserves
Conservation of Biological Diversity		**Low/moderate risk**: Some activities of Component 1, such as the promotion of new crop varieties, could potentially have adverse impacts on biodiversity, leading to a deterioration of biological diversity if species are not correctly selected (e.g. inadvertent introduction of invasive species) and diversified. To ensure this risk is addressed, the project will prioritize local species and multi-species planting and avoid the use of non-native and invasive species. These activities will be designed in close collaboration with the NCOA of the DoA and other agricultural research institutes. As a result, the project is not expected to have any adverse impact on the environment or biodiversity. The project is indeed designed to enhance biodiversity through the promotion of organic production and GAPs.
Climate Change		**Low risk**: The entire project is designed to reduce beneficiaries' exposure and vulnerability to the effects of climate change and increase their resilience. The project will not generate any significant emissions of greenhouse gases or reduce the capacity of carbon sinks. Many project activities will be designed to be low-emissions, as well as adaptive – e.g. the promotion of conservation agriculture and organic production. As the project area is highly vulnerable to the impacts of climate change, all project components and activities will be designed to contribute to increasing local capacities to sustainably face climate change in the long-term, and climate variability in the short -and medium-term. The promotion of i) good agronomic practices for better management of soil and water resources; ii) organic production and Integrated pest management techniques coupled with the use of organic fertilizers; and iii) the increase of carbon sinks' potential through conservation agriculture, are expected to reduce the emissions deriving from agricultural activities. Plants and crops will be selected to ensure a better adaptability to the current and projected climatic conditions.
Pollution Prevention and		**No risk**: None of the activities in the project will release pollutants into the air, soil or water. Under the project's approach to enhancing agricultural production

Resource Efficiency		through GAPs, conservation agriculture and organic production, chemical inputs will be replaced by locally made biofertilizer and pesticide, use of liquid fertilizer will be promoted, and the project will encourage integrated pest management. The project will not provide any agro-chemicals to participants. None of the activities will generate waste, either hazardous or non-hazardous. None of the activities in the project involves high resource use, as energy efficiency, minimization of material resource use, and minimization of the production of wastes has been embedded into project design.
Public Health		**Low/no risk**: The project will not have any detrimental effect on public health. It is designed to be nutrition sensitive, and thus will contribute to tackling the underlying causes of malnutrition through increasing agricultural production and processing, promoting sustainable natural resource management and supporting nutritious value chains.
Physical and Cultural Heritage		**Low/no risk**: The project will ensure that culture and traditional knowledge from the smallholder farmers will be valued and integrated into the provision of enhanced localised climate services. The project will identify secondary adaptation innovations to be integrated into the rollout of the primary innovation of index-based microinsurance. The project's learning and knowledge management activities (under Component 1) will document this. Consultations and engagement with stakeholders and communities during implementation will ensure that any physical cultural heritage present on project sites is identified and potential negative impacts are avoided through project design.
Lands and Soil Conservation		**Low/no risk**: Project activities will not pose risks to land and soil conservation, but rather will be specifically designed to address land degradation and promote sustainable land management and erosion control. Conservation agriculture and organic production activities will additionally support protection and enhancement of lands and soil fertility and soil structure. All activities are of small-scale (managed at individual, household, or community level) and any possible residual impact would be negligible and readily remediable.

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

A. Record of endorsement on behalf of the government[125]

Provide the name and position of the government official and indicate date of endorsement for each country participating in the proposed project / programme. Add more lines as necessary. The endorsement letters should be attached as an annex to the project/programme proposal. Please attach the endorsement letters with this template; add as many participating governments if a regional project/programme:

(Enter Name, Position, Ministry) *Offtg. Secretary* *Gross National Happiness Commission*	Date*: (Month, day, year)*
(Enter Name, Position, Ministry) Secretary Ministry of Agriculture and Forests	Date*: (Month, day, year)*
(Enter Name, Position, Ministry)	Date*: (Month, day, year)*

6. Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

B. Implementing Entity certification

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (……list here…..) and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
Name & Signature Implementing Entity Coordinator	
Date: *(Month, Day, Year)*	Tel. and email:
Project Contact Person:	
Tel. And Email:	

Annex 1 Gender Assessment

1. Gender Assessment objective and methodology

A detailed Gender Assessment was conducted to inform the development of this Concept Note. The main objective of this gender assessment was to contribute to the overall project "to assist smallholder famers to address their key identified climate change risks, and to increase their resilience and adaptive capacity" in a gender-responsive way. Specifically, this assessment aimed to provide an overview of gender issues in Bhutan in the legal and socio-cultural context, highlight differentiated gender impacts of climate change and also gender situations specific to agriculture or smallholder farmers, and provide gender-specific recommendations to address these identified risks and to increase their resilience and adaptive capacity.

Collection of data and information for this gender assessment through primary source – surveys, key informant interviews, and focus group discussions – could not be conducted due to the nature of the COVID-19 pandemic restrictions at the time of conducting the assessment (April 2022). Specifically, a lockdown and travel restrictions were imposed by the government in major parts of Bhutan to contain the Omicron outbreak. However, information and data relevant to the assessment was collected using secondary sources – data and studies conducted on gender, its equalities and equities, and gender-climate interactions in Bhutan particularly in agriculture sector conducted by the National Commission for Women and Children (NCWC) and international organizations including the Asian Development Bank (ADB), World Bank, and various UN Agencies.

Specifically, this assessment extensively reviewed studies conducted on gender-climate-agriculture nexus in the Bhutanese context by related organizations which had similar objectives and concerns – to study and recognize gender differentiated impacts of climate change (especially in agricultural sector), and accordingly correct/improve the marginalized and vulnerable with appropriate effective policy interventions, programmes and projects. Most of these studies were designed to equally consider perceptions of both men and women participants on climate change, its impacts, livelihood risks, adaptive capacities, available resources to cope with the changing climate conditions impact, underlying causes for any differences, and their preferences for adaptation interventions.

As the full Gender Assessment report has a total of 59 pages, it was not possible to include the full report in an annex, given the page limits for Concept Notes. Therefore, an executive summary of the findings of the assessment is included below. The full report, with all associated references, is available upon request.

2. Executive Summary of the findings of the Gender Assessment

Bhutan, given its location and mountainous topography, is highly vulnerable to climate change and its impacts. In recent years, Bhutan has been witnessing and experiencing rapid changes in average temperatures and precipitation patterns, as well as increased risks of climate hazards. The mean annual temperature has increased by 0.8°C for Bhutan, as per the 2019 National Center for Hydrology and Meteorology (NCHM) report.

The 2020 Nationally Determined Contributions (NDC) survey conducted by NCWC substantiates that 96 percent reported experiencing 'warmer weather' and 'unpredictable weather indicating Bhutanese people are being affected by climate change. Simulated projections have also shown rising trends in temperature and precipitation in both winter and summer with large anomalies during the monsoon season in Bhutan.

Evidently, such erratic extreme weather patterns and events pose a serious threat especially to the agriculture sector, that is highly climate-sensitive and on which the majority of the country's population is heavily reliant on. Therefore, Bhutanese farmers who are generally smallholders are found hit hardest by climate change. In particular, women are more vulnerable and thus affected more by the climate change compared to men due to their substantial engagement (at 61.7 percent against 41.7 percent men) in agriculture, compounded further by the increasing feminization of agriculture sector. Moreover, climate change impacts are more pronounced for Bhutanese women due to the existing discriminatory, patriarchal laws, norms, customs and institutions.

Although, women's status is relatively high in Bhutanese society, there is a continuous and concrete perception that women and men have specific roles to play; regarding women as a better homemaker, wife, and a mother which has limited their access and opportunities, whilst confining them to household and agricultural activities where productivity and earnings are relatively low. Men's participation in regular paid employment is, therefore, higher at 36.5 percent against 19.3 percent for women. Bhutanese women predominate among unpaid family workers and workers with low earnings, and thus bear a disproportionate responsibility for domestic unpaid care work that largely goes unrecognized. To add on, the COVID-19 pandemic and recurrent lockdowns have increased unpaid work especially for women and girls, strongly reinforcing social and cultural norms where women and girls are expected to do unpaid household chores. Additionally, rural women seem to carry a disproportionate share of voluntary (unpaid) community work, affirming the triple role and burden for Bhutanese women. Rightly so, the 2010 GNH Index revealed that Bhutanese women worked almost one hour more per day than men. One of the most significant social impacts of climate change for rural women is intensification of their already over-burdened workloads, leaving them time-deprived. For instance, women will need to travel further away to collect fuel wood (used by many rural households in Bhutan for cooking and heating), increasing their already substantial workload.

Other indirect climate change impacts include an increase in gender-based violence, in particular intimate partner violence, due to intra-household tensions and pressures. Recent study on the situation of Violence against Women in Bhutan revealed that one in three ever-partnered women aged 15–64 years had experienced one or other forms of domestic violence in the last twelve months, and 44.5 percent in their lifetime (as of 2017). Moreover, with the on-set of the pandemic and multiple lockdowns, Gender-based violence (GBV) has reportedly increased by 36.6 percent and 53.5 percent in 2020 and 2021 respectively. An even more disturbing finding from the same study was the extent to which domestic violence was condoned by Bhutanese women. As of 2017, the same study found that 53.4 percent of women aged between 15-64 years believed that their partners were justified to hit them for under certain circumstances and reasons. Bhutanese women commonly accept abuse as their plight or their 'karma' whilst the culture of silence they practice prevents them from accessing what public services are available. Moreover, Bhutanese women's economic dependence on their husbands aggravates their vulnerable situation and acceptability of domestic violence. This only heightens women's marginalized and hence more vulnerable situation, constraining them and their adaptive capabilities to the impacts of climate change.

Moreover, Bhutanese women's limited access and controls of resources impedes their capability and efficiency in agricultural development and their adaptive capacity to climate change. Despite the equal legal rights enshrined, Bhutanese women have limited access and control to resources. Of the agriculture land holdings, 54 percent is held by men and 46 percent by women. Similarly, the 2020 NDC survey shows that 32.01 percent women owning land against 63.24 percent men. Men are reported to be the main decision-makers regarding land use, and women were found to be sole decision-makers only in the case of an absent male. In addition, despite Financial Institutions (FIs) equal and non-preferential treatment, and government's concerted effort to advance financial inclusion such as priority sector lending, limited access to finance is one of the many constraints faced by rural women. This limited access could be attributed to lack or limited resources for collateral, limited decision-making power and position, complex loan procedures, and loans not suitable to their needs. Although there are numerous savings and credit schemes, they are mostly commercial and entrepreneurship focused. There are hardly rural-women-targeted schemes that are agricultural (small-holder farmers) focused to enhance their adaptability and resilience to climate change impacts. There is an increasing need for such financial instruments and schemes covering these insecurities and risks.

In addition, while in practice higher substantial proportion of women are engaged in agriculture related activities, however, access to Climate Smart Agriculture (CSA) and Climate Resilient Agriculture (CRA) related technologies, information, trainings and agricultural inputs are limited for rural women in Bhutan. As per the FAO estimates, if women farmers had the same access to resources as men, agricultural output in developing countries would rise by an estimated average of up to four percent, and reduce the number of undernourished people in these countries by as much as 17 percent, translating to up to 150 million fewer hungry people.

Moreover, women's participation in political, civil, economic and social life at all levels is limited due to social and cultural perception about men and women's leadership with stereotypic image of women as less capable leaders. In the parliament and local government, women's participation stands at 15.3 percent and 3.4 percent respectively. Similarly, women are also not well represented in civil service especially at the upper levels with 13.8 percent women against 86.12 percent men. Therefore, women continue to be under-represented in political and public spheres and are found more active in decision-making at private and micro level. Likewise, their participation in decision-makings related to agriculture is found limited, despite their higher composition and exposure to climate change impacts.

Since the effects of climate change are different for women and men, they respond and adapt to climate change impacts differently. As measures to alleviate climate change impacts, men are more inclined to 'look for alternative employment' and 'migrate to city'; leaving women to carry out men's work in addition to their already substantial workloads. On the other hand, women struggle more than men in finding alternative livelihoods, entering formal employment sector, or migrating due to cultural barriers and lack of economic opportunities and education. Thus, women reported alternatives, including; 'change in consumption patterns', 'changing farming practices', and 'taking children out of school'. Bhutanese women (rural women in particular) are therefore more susceptible and vulnerable than men to the climate change impacts.

However, they are the key players of agriculture and in ensuring food and nutrition security in the country, with their unique set of knowledge and strengths. Empowering women to contribute their skills and knowledge whilst addressing their heightened vulnerabilities to climate change will therefore be a key to addressing threats to food security and sustainability. Climate change has direct impacts on all aspects of food security, aggravating the country's health and nutritional status and exacerbating the prevalent triple burden of malnutrition in the country. Additionally, the COVID-19 pandemic has intensified food and nutrition insecurities in the Country. Loss of jobs and income from the pandemic meant giving up nutrient-rich foods and shifting diets to more affordable food – shelf stable and pre-packaged foods. Also, with schools closed after the pandemic, 71 percent of the school children in 2020 missed out on the fortified school meals– an essential source of nutrition for children from rural background.

In terms of legal and institutional frameworks, Bhutan has made significant investments in promoting gender equality and women/girls' empowerment. In addition to Constitutional guarantee of equal fundamental rights of women and men, the protection of women and girls have been strengthened by the Child Care and Protection Act 2011 (CCPA), the Penal Code (Amendment) of Bhutan 2011 (PCB), and the Domestic Violence Prevention Act 2013 (DVPA). Also, the RGoB has adopted several international and national legal frameworks of relevance from a gender perspective, including; Convention on the Elimination of all forms of Discrimination Against Women (CEDAW), the Beijing Platform for Action (1995), and Agenda 2030 with its Sustainable Development Goals. Most recently, the National Gender Equality Policy 2020 has been endorsed by the Government.

All laws, to the extent possible, attempt to ensure that the rights of women and men are equally included and treated. Every policy in Bhutan is required to be screened using the GNH policy screening tool, which has gender equality as one of the parameters in rating a policy. The NCWC is the main coordinating institutional body for the review, formulation, reform, initiatives, advocacy and support of policies, plans, projects and activities from a gender equality and child-sensitive perspective. The growing numbers and strength of CSOs play an increasingly important role by helping the economically marginalized and the vulnerable women groups. While there are adequate legal frameworks and institutions to address gender issues and gaps, nevertheless, there is an increasing need and efforts to integrate gender into plans, policies, programmes, and projects.

3. Recommendations

Specifically, to address these heightened climate change risks and vulnerabilities, there is a pressing need to adopt gender-responsive (and where possible, gender-transformative) approaches if it is to help achieve food

and nutrition security, sustainability and poverty alleviation. In line with this, the project is recommended to consider the following in its design, implementation and monitoring:

i. Recognize and support women's under-valued contributions to household and community livelihoods which is an important strategic element to build household and community resilience;

ii. Support empowerment and leadership-building of rural women, and their active meaningful involvement in the mitigation and adaptation activities. Besides, a central part of gender transformation is women's empowerment that enables transformation in the power structures;

iii. Work with rural men as allies and facilitate men to support women's empowerment, leadership, voice and participation. This will help challenge and transform dominant social, economic, and political structure that perpetuate gender inequality;

iv. In all its integrated R4 rural risk management strategies and interventions, the project, should target to include more women at 61:41 men in order to ensure gender equality. In particular, female-headed households should be targeted since they are more food insecure than the male-headed households;

v. Include female farmers during the Project's feasibility assessment and prototype testing of the Weather Insurance Index, wherein they are equally and effectively consulted in the agreement of the pre-determine statistical index;

vi. Promote inclusive, active and meaningful participation of female farmers in and during the Project's community consultations, awareness-raising program about the insurance product, and during the sensitization on the benefits of the Weather Index Insurance;

vii. Ensure rural women's equitable access to Weather Index-based Microinsurance since limited access to credit and finance is one of the major challenges constraining rural women;

viii. The project's enhanced Natural Resources Management activities and initiatives should be gender-inclusive and designed as to reduce or at best not increase the workload of already over-burdened and time-deprived rural women;

ix. Ensure equitable access to the project's monetary and in-kind saving schemes and programmes;

x. Enhance gender-equity in accessibility to climate information and services in order to better cope with climate variability and adapt their decision-making in farming practices and crop management;

xi. The project's partners, local leaders and authority, and other stakeholders should be adequately sensitized and trained on the importance of gender-responsive approach and women empowerment, and also on the SBC for improved dietary, nutrition and health practices;

xii. Since one of the major gender issues impacting women is the prevalence of GBV, the project in collaboration with the NCWC and/or RENEW MFI should conduct awareness and sensitization program on GBV and their impacts for women;

xiii. Include a gender-specialist with adequate gender knowledge in the local context to provide advice within the project and ensure gender equality and responsiveness throughout;

xiv. Monitor and assess the project's progress, its impacts, and benefits using gender-disaggregated data and gender specific indicators;

xv. Measure gender transformation during/after the project, using the 'Women's Empowerment in Agriculture Index (WEAI)' tool that measures changes associated with the root causes of gender inequality especially in agriculture; and

xvi. Lastly, ensure that good practices and lessons learnt from promoting gender equality evidenced through the project are shared effectively and continuously amongst stakeholders, and inform policy/decisions at national and local levels.

The full Gender Assessment contains a list of the 67 references used in compiling the assessment, which can be provided on request

Annex 2 Summary of national stakeholder consultations

A. National Multi-Stakeholder Workshops

Punakha Workshop, September 28-29, 2021

Background: A multi stakeholder consultation was held in Punakha between September 28 – 29, 2021 led by the Gross National Happiness Commission (GNHC), as the National Designated Agency of the Royal Government of Bhutan in collaboration with the WFP for the Large Innovation Grant (LIG). The objectives of the workshop were to (i) provide background on the proposed Adaptation Fund Large Innovation Grant; (ii) discuss and agree on the focus for the LIG project; and (iii) agree on the stakeholder and community consultations process for the LIG.

Participants: The workshop brought together a diverse range of relevant stakeholders, including the Department of Livestock, Policy and Planning Division, Department of Agriculture, and National Center for Organic Agriculture from the Ministry of Agriculture and Forests, GNHC, District Agriculture Officers, Department of Disaster Management, and National Center for Hydrology and Meteorology. The meeting had 15 male and 4 female participants.

Output: Through a consultative process, the following 11 possible innovation focus areas to consider for the LIG, which included both local innovations as well as innovations from other countries / regions were identified as priority needs in enhancing the resilience of the agriculture sector in Bhutan.

Thematic area	Areas of intervention
1) Adaptive production	• Enhance services to counter pests and diseases • Community based rangeland management • Protected Agriculture and Organic Farming • Sustainable Land Management • Adaptative Farming to counter Climate Behaviour
2) Improve access to markets	• Improve linkages between producers and market
3) Improve water use & management	• Enhanced water harvesting • Efficient water Use: Smart irrigation systems/technologies
4) Enhance climate services	• Enhanced weather forecast services for informed decisions: Economic Activities and Disaster Risk Reduction • Weather and climate services for building climate resilience through enhanced weather forecast services • Climate index micro- insurance schemes: Enabling environment to enhance National Food and Nutritional Security

Follow up: Based on further discussion between the GNHC and the WFP, it was agreed that the LIG proposal will focus on the climate index based micro- insurance schemes, considering its need in the country and qualifying as an innovation for Bhutan.

Thimphu Workshop, October 29, 2021

Background: A multi stakeholder consultation was held in Thimphu to conduct a deeper dive on the status of crop insurance including challenges faced by the farmers and challenges in instituting crop insurance schemes in Bhutan. The objectives of the workshop were to: (i) better understand the needs of crop insurance in Bhutan and; (ii) present the WFP's integrated approach to weather-index insurance as a potential solution to Bhutan's challenges. This workshop was mainly focused on the agriculture sector.

Participants: The participants included officials from Agriculture Research and Extension Division, National Plant Protection Center, National Soil Service Center, and National Center for Organic Agriculture from the Department of Agriculture, and Policy and Planning Division of the Ministry of Agriculture and Forests, National

Center for Hydrology and Meteorology, Bhutan Trust Fund for Environmental Conservation and the UNDP. The meeting had 11 male participants.

Output: The participants came to an agreement on the need for micro-insurance in the agriculture sector.

Thimphu Workshop, June 15, 2022

Background: A multi stakeholder consultation was held in Thimphu to present the framework of the proposed project and to agree the project components, outcomes and outputs. In addition, WFP provided a recap of the Adaptation Fund criteria, the process undertaken to date and next steps.

Participants: The participants included officials from the Agriculture Research and Extension Division and the Policy and Planning Division of the Ministry of Agriculture and Forests, Gross National Happiness Commission, National Center for Hydrology and Meteorology, National Environment Commission, Ministry of Finance, Bhutan Trust Fund for Environmental Conservation, the Microfinance Institutions (MFIs) of RENEW (Respect, Educate, Nurture and Empower Women) and Tarayana; and the two insurance corporations in Bhutan, namely Bhutan Insurance Limited, and Royal Insurance Corporation of Bhutan (RICB).

Discussion: There were discussions and queries on:

- Selection of the dzongkhags for community consultations: the DOA clarified that due to the lockdowns because of COVID-19, the selection was done based on what was feasible for the consultations.
- Shifting of use of traditional knowledge to scientific based weather forecasting or their use in conjunction.
- The importance to develop a sustainability plan of the insurance schemes after the end of the project.
- The project should be developed to provide an integrated resilience approach such as financial literacy, enhancing agromet services, etc.
- The coverage of the insurance schemes.

Conclusion: The participants agreed on the overall project framework as presented and agreed to participate in the follow up discussions and contribute as required.

Insurance Workshop in Thimphu, June 23, 2022

Background: A multi-stakeholder consultation was held in Thimphu to present and discuss (i) a summary of findings from the various consultations held with communities, relevant agencies in the Royal Government of Bhutan, Insurance companies, Banks and Microfinance Institutions catering to the rural population; and (ii) insurance types are available in the market, key characteristics of these options, and suitability for Bhutan's context. The Royal Insurance Corporation of Bhutan (RICB) presented a summary of the Priority Sector Lending (PSL) scheme as background on existing crop insurance in the country.

Participants: The participants included officials from Gross National Happiness Commission, RENEW MFI, Taryana MFI, Ministry of Agriculture and Forests, Agro-Logistics and Marketing Cooperative, RICB and Bhutan Insurance Limited. There were 12 participants with 4 women and 8 men.

Discussion: The discussions included the following:

(i) Priority Sector Lending (PSL) Crop Insurance Schemes – This was launched in 2017 through a collaborative process between the insurance companies, Department of Agriculture (DoA) and Royal Monetary Authority. This insurance is only applicable to those farmers who have taken a loan from the PSL. The PSL Insurance Scheme came about upon the request of the banking institutions to provide security to the lending part. The PSL faced challenges with recovery and the process was found tedious as it required verification at the district and the insurance company. (ii) *Queries on area yield and weather-based index insurance* – There were queries on how these schemes work, what are the verification measures put in place to ensure that farmers use adequate inputs, what happens if crops are damaged at early stages in a yield-based microinsurance scheme and if the insurance renewal is annual. The WFP team clarified some of the queries and added that the technical details will be a part of the design of the insurance products based on the needs of the farmers. (iii) *Crop and district selection* – The DoA and WFP agreed to further discuss the selection of potential crops

and districts within a week's time. It was agreed that it would be important to know the number of farmers in each selected district and the project could focus on up to 6 dzongkhags.

Conclusion: The participants expressed that the proposed crop insurance project will be an opportunity to understand how crop insurance works and will also give confidence to the relevant stakeholders.

Annex 3 List of stakeholders consulted at the national level

Institution	Name	Position	Gender
Government			
Department of Agriculture, Ministry of Agriculture and Forests	Mr. Wangda Dukpa	Advisor	Male
	Mr. Tirtha Bdr. Katwal	Programme Director	Male
	Mr. Lakey	Principal Agriculture Officer	Male
	Mr. Tshering Wangchen	Deputy Chief Agriculture Officer	Male
	Mr. Saha Bir Rai	Deputy Chief Agriculture Officer	Male
	Mr. Dorji Rinchen	Deputy Chief Agriculture Officer	Male
	Mr. Sagar Acharya	Sr. Agriculture Officer	Male
	Mr. Sangay Chophel	Sr. Plant Protection Supervisor III	Male
	Mr. Jigme Tshering	Land Management Officer	Male
	Mr. Kailash Pradhan	Agriculture Officer	Male
	Mr. Jimba Rabgyal	Agriculture Officer	Male
	Ms. Kesang Tshomo	Project Manager of National Organic Flagship Program	Female
Department of Livestock, Ministry of Agriculture and Forests	Sonam Wangchuk	Livestock Officer	Male
Policy and Planning Division, Ministry of Agriculture and Forests	Mr. Dorji Wangchuk	Planning Officer	Male
	Mr. Sonam Pelgen	Planning Officer	Male
Policy and Planning Division, Ministry of Finance	Mr. Lobzang Dorji	Sr. Planning Officer	Male
Department of Disaster Management, Ministry of Home and Cultural Affairs	Mr. Thinley Norbu	Chief Program Officer	Male
	Mr. Tshering Dorji	Assistant Program Officer	Male
Gross National Happiness Commission	Mr. Wangchuk Namgay	Chief Programme Coordinator	Male
	Ms. Kuenzang L Sangey	Chief Planning Officer	Female
	Ms. Tandin Wangmo	Chief Planning Officer	Female
	Mr. Karma	Sr. Language Development Officer	Male
	Ms. Dorji Pem	Programme Coordinator	Female
	Ms. Dhendrup Tshering	Assistant Programme Coordinator	Male
	Mr. Kuenzang Tobgye	Assistant Project Coordination Officer	Male
National Center for Hydrology and Meteorology	Mr. Singay Dorji	Chief	Male
	Mr. Ugyen Chophel	Sr. Statistician	Male
	Mr. Saroj Acharya	Hydrology Meteorology Officer	Male
	Ms. Phuntsho Wangmo	Assistant Environment Officer	Female

Institution	Name	Position	Gender
National Council for Women and Children	Ms. Ugyen Tshomo	Chief Programme Officer	Female
	Ms. Yeshey Lham	Chief Programme Officer	Female
	Ms. Tshewang Lhamo	Sr. Programme Officer	Female
National Environment Commission	Mr. Tshering Tashi	Officiating Chief Environment Officer	Male
	Mr. Tashi Dendup	Sr. Environment Officer	Male
	Ms. Tshering Yangzom	Sr. Environment Officer	Male
	Mr. Sonam Dargay	Environment Officer	Male
Gasa Dzongkhag	Mr. Tashi Dendup	Planning Officer	Male
Haa Dzongkhag	Mr. Cheda Jamtsho	Planning Officer	Male
Punakha Dzongkhag	Mr. Gyembo Namgay	Agriculture Officer	Male
	Ms. Rinzin Lhamo	Agriculture Officer	Female
University			
College of Natural Resources	Ms. Rekha Chhetri	Assistant Professor	Female
	Ms. Chogyal Wangmo	Associate Lecturer	Female
Development Partners			
Bhutan Trust Fund for Environmental Conservation (BTFEC)	Mr. Singye Dorji	Officer In-charge	Male
	Mr. Dorji	Acting Chief Program Officer	Male
	Ms. Sonam Wangmo	Administrative/ Human Resource Officer	Female
	Mr. Thinley Wangdi	IT/ Data Manager	Male
	Ms. Phuntsho Choden	Programme Officer	Female
	Ms. Rinchen Dema	Assistant Finance Officer	Female
Food and Agriculture Organization	Mr. Chador Tenzin	Assistant Representative	Male
United Nations Development Programme (UNDP)	Mr. Sangay Chophel	GCF Project Technical Specialist	Male
World Food Programme (WFP) Innovation Accelerator	Mr. José Shehata	Innovation Venture Consultant	Male
	Mr. Dahy Ahmed	Innovation Venture Consultant	Male
	Mr. Xavier Herault	New Ventures Consultant	Male
Corporations			
Bhutan Development Bank Ltd.	Mr. Phub Dorji	Chief Executive Officer	Male
	Ms. Sonam Pelden	Credit Officer	Female
	Mr. Yoezer Pelden	Microfinance Officer	Male
	Ms. Pema Choden	Credit Officer	Female
	Ms. Phuntsho Choden	Credit Officer	Female
	Mr. Sangay Tshewang	Credit Officer	Male
National Development CSI Bank Ltd	Mr. Sonam Rigyel	Director	Male
Royal Insurance Corporations of Bhutan	Mr. Divya Dewan	Manager Underwriting	Male
	Mr. Sonam Dargay	Manager Claims	Male
	Mr. Tashi Tshering	Manager	Male
	Mr. Gangay	Assistant Manager	Male

Institution	Name	Position	Gender
	Mr. Subash Mongar	Assistant Development Officer	Male
Civil Society Organization			
Youth Development Fund	Ms. Roma Pradhan	Sr. Programme Coordinator	Female
	Mr. Sonam Gyamtsho	Programme Officer	Male
	Mr. Karma Chophel	Project Officer	Male
Cooperatives			
Agro-Logistics Marketing Cooperative	Mr. Sangay Needup	Chairman	Male
Private sector			
Bhutan Insurance Limited	Mr. Yeshey Lotey	General Manager	Male
	Ms. Dawa Choden	Deputy Manager	Female
RENEW Microfinance	Mr. Bernd Baehr	Chief Executive Office	Male
	Ms. Tshering Dema	Deputy Chief Executive Officer	Female
	Mr. Jampelyang Dorji	Chief IT Officer	Male
	Ms. Susmita Subba	Sustainability Officer	Female
Tarayana Microfinance	Mr. Karma Dorji	Chief Executive Officer	Male
	Mr. Jamyang Phuntsho	Company Secretary	Male

Participants in the National Validation Workshop held in Thimphu, 20 July 2022

1. Mr. Wangda Drukpa, Advisor, Department of Agriculture (DOA)
2. Ms. Kesang Tshomo, Project Manager of National Organic Flagship Programme, DOA
3. Mr. Lakey, Principal Agriculture Officer, DOA
4. Mr. Sagar Acharya, Senior Agriculture Officer, DOA
5. Ms. Tshering Dema, Dy. CEO, RENEW MFI
6. Ms. Susmita Subba, Sustainability Officer, RENEW MFI
7. Mr. Yeshey Lotay, General Manager, Bhutan Insurance Limited (BIL)
8. Mr. Kelden Dorji, Assistant Manager, BIL
9. Ms. Phuntsho Choden, Assistant Programme Officer, Bhutan Trust Fund for Environmental Conservation (BTFEC)
10. Mr. Dungkar Drukpa, OIC, WFP Bhutan Country Office
11. Mr Binai Lama, Food Systems and Agriculture Value Chain Specialist, WFP Country Office
12. Ms. Dechen Tshering, WFP National Consultant
13. Ms. Katiuscia Fara, Senior Climate and Disaster Risk Reduction Advisor, WFP Regional Bureau Bangkok
14. Ms. Penny Urquhart, WFP International Consultant
15. Ms. Shayne Rose Bulos, WFP HQ (Rome), Insurance and Financial Inclusion Specialist

B. Implementing Entity certification

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (12th Five Year Plans, 21st Century Economic Roadmap, National Climate Change Policy, National Adaptation Plan (under development), and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
CarrieMorrison 05/08/2022 **Carrie Morrison** **Representative and Country Director** **WFP Bhutan**	
Date: 05 August 2022	Tel. and e-mail: +9752322424 carrie.morrison@wfp.org
Project contact person: Mr. Binai Lama, Programme Policy Officer, WFP Bhutan	
Tel. And e-mail: +97517448670 binai.lama@wfp.org	

འབྲུག་གི་རྒྱལ་ཞབས།
རྒྱལ་ཡོངས་དགའ་སྐྱིད་དབུལ་འཛོམས་ལྷན་ཚོགས།
Royal Government of Bhutan
Gross National Happiness Commission

GNHC/DCD/AF-DA/2022-2023/**1543** 05/08/2022

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for the project "Innovative adaptation financing to build the resilience and adaptive capacity of smallholder farmers in Bhutan (InAF-Bhutan)"

Greetings from the Gross National Happiness Commission Secretariat (GNHCS), which houses the Designated Authority to the Adaptation Fund Secretariat. In this regard, GNHCS would like to extend our words of acknowledgement to the AF Secretariat for its conveyance of national climate actions and priorities.

In my capacity as Designated Authority for the Adaptation Fund in Bhutan, I confirm that the above national project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in Bhutan.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by World Food Programme Country Office, Bhutan and executed by the Ministry of Agriculture and Forests, Royal Government of Bhutan
Thanking you,

Yours Sincerely,

W. Namgay

(Mr. Wangchuk Namgay)
Officiating Secretary.
Designated Authority

GROSS NATIONAL HAPPINESS COMMISSION ★THIMPHU : BHUTAN★

Copy to:
1. Hon'ble Secretary, Ministry of Agriculture and Forests, for kind information.
2. WFP Country Office, Bhutan for kind information.