



# REGIONAL PROJECT/PROGRAMME PROPOSAL

## PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme:	Strengthening resilience of vulnerable communities in Sri Lanka and India to increased impacts of climate change
Countries:	Sri Lanka and India
Thematic Focal Area:	Food security
Type of Implementing Entity:	Multilateral Implementing Entity (MIE)
Implementing Entity:	World Food Programme (WFP)
Executing Entities:	Sri Lanka: Ministry of Environment India: Ministry of Environment, Forest and Climate Change
Amount of Financing Requested:	13,995,524 (in U.S Dollars Equivalent)

### A. Project Background and Context

#### Location and climate

The project is a regional initiative targeting dryland localities within the dry zone of Sri Lanka and the eastern coast of India. In Sri Lanka, the project will focus on districts in the dry zone,<sup>1</sup> while targeted areas in India will be within the states of Odisha and, to a lesser extent, Andhra Pradesh and Tamil Nadu.<sup>2</sup> The targeted areas in both countries share similar climate risks, agro-ecological conditions and socio-economic vulnerabilities. Climate change impacts already affecting the project areas in Sri Lanka and India include delayed monsoon rains, increased average temperature leading to more heat stress, more variable rainfall, and increased frequency of heatwaves and droughts, which result in reduced food and water security, as well as adverse effects on human health, natural ecosystems and biodiversity. The districts to be targeted will be selected during full proposal development.

The tropical island of **Sri Lanka**, with a land area of 62,610 square km, lies south east of the Indian subcontinent (land area 2,973,190 square km<sup>3</sup>), separated from the Indian state of Tamil Nadu by the Palk Strait. Altitude governs Sri Lanka's regional differences in air temperature. In the lowlands, up to an altitude of 100 to 150 m, the mean annual temperature is 27.5 degrees C, while that of Nuwaraeliya, at 1800 m sea level, is 15.9 °C. The north-east (NE) monsoon brings rain to the northern and eastern regions in December and January, while the western, southern and central regions of the island get rain from May to July due to the south-west (SW) monsoon.<sup>4</sup> Sri Lanka's mean annual rainfall is 1,850 mm, ranging from 900 mm in the driest south-eastern and north-western parts, to 5,000 mm on the western slopes of the central highlands.<sup>5</sup>

While **India** has a variety of climate regimes, the SW monsoon (June-September) is the most important climatic feature, bringing nearly 75 percent of the annual rainfall of the country. The northeast (NE) monsoon (October-December)<sup>6</sup> brings rain mainly to the southeast parts. Andhra Pradesh receives 70 percent<sup>7</sup> and Odisha receives 80 percent of its rainfall during the SW monsoon,<sup>8</sup> while Tamil Nadu state has a different annual rainfall distribution, with 48 percent falling during the NE monsoon, and only 32 percent through the SW monsoon.<sup>9</sup>

#### Environmental and agro-ecological conditions

<sup>1</sup> Sri Lanka's Dry Zone lies across the Eastern, Northern, North-central, North-western, Central, Uva, and Southern provinces.

<sup>2</sup> The inclusion of some districts in the state of Andhra Pradesh will be further explored with the key stakeholders during development of the Full Proposal.

<sup>3</sup> Land areas taken from World Bank <https://data.worldbank.org/indicator/AG.LND.TOTL.K2?locations=IN>

<sup>4</sup> [http://www.climatechange.lk/Climate\\_Profile.html](http://www.climatechange.lk/Climate_Profile.html) accessed 03/02/21.

<sup>5</sup> Climate Change Secretariat (2016) 'National Adaptation Plan for Climate Change Impacts in Sri Lanka 2016-2025.

<sup>6</sup> [http://uchai.net/pdf/knowledge\\_resources/Publications/Reports/Climate%20Profile%20India\\_IMD.pdf](http://uchai.net/pdf/knowledge_resources/Publications/Reports/Climate%20Profile%20India_IMD.pdf) accessed 15 June 2021.

<sup>7</sup> Andhra Pradesh State Action Plan on Climate Change, 2012.

<sup>8</sup> [https://imd pune.gov.in/hydrology/rainfall%20variability%20page/odisha\\_final.pdf](https://imd pune.gov.in/hydrology/rainfall%20variability%20page/odisha_final.pdf) accessed 15 June 2021.

<sup>9</sup> Tamil Nadu State Action Plan for Climate Change

**Sri Lanka** is the most biodiverse Asian country in terms of species density, related to its diverse topography and ecosystems. The central mountain region is surrounded by a plain, which covers over two-thirds of the land area and rises to 300 metres above mean sea level. Approximately 65 percent of the country is agricultural land, while forests cover some 28.8 percent.<sup>10</sup> These include rainforests, mountain cloud forests, dry zone monsoon forests and arid thorn scrub forests. The dry zone, located on the coastal plain, lies largely within the mixed dry evergreen forest eco-region.

**India** has great geographic diversity, including the Himalayas in the north, the tropical wet evergreen forests in the north east and the south west, and the tropical dry thorn forests in the central and western states. Approximately 46 percent of the country is under crops, with 24 percent under forests and tree cover.<sup>11</sup> The dryland areas targeted by the project lie inland from the eastern coast and encompass some mountainous areas of the eastern range that include forested areas. India is a recognized mega-diverse country, and it includes one of the eight Vavilovian centres of origin and diversity of crop plants, having more than 300 wild ancestors and close relatives of cultivated plants, which are still evolving under natural conditions.

These rich ecosystems in both countries are threatened by habitat loss, fragmentation and degradation, overexploitation of biological resources, loss of traditional crop and livestock varieties and breeds, pollution, deforestation, water scarcity, human/wildlife conflicts, the burgeoning spread of alien invasive species, climate change and desertification, increasing human population density, and the impact of development projects.<sup>12</sup> Reclamation of wetlands, indiscriminate use of coastal lands and landfills in wetlands also drive habitat loss. Environmental challenges are becoming more urgent in both countries, particularly in the dryland areas where land degradation, which leads to increased poverty through reduced land productivity and loss of biodiversity, is a serious issue that is exacerbated by climate change.<sup>13</sup> India has one of the largest populations living on degraded land in the world. Deforestation is the most serious threat to terrestrial biodiversity in Sri Lanka, with 50% of its forest cover lost within 50 years.<sup>14</sup>

## Socio-Economic Characteristics and Vulnerabilities

### Population, economy and poverty

The South Asian region is home to 1,836 billion people, of which 1.3 billion live in India, (the second most populous country in the world), and 21.8 million reside in Sri Lanka. Sri Lanka and India are both classified as lower-middle income countries.

**Sri Lanka** has an average population density of 348 per square km<sup>15</sup>, and ranks 72<sup>nd</sup> out of 189 countries on the Human Development Index (HDI) (score of 0.78).<sup>16</sup> Official statistics indicate Sri Lanka's urban population is relatively low, reportedly 19.3 percent in 2016<sup>17</sup>; however, one quarter of the population is believed to live in the metropolitan area of Colombo.<sup>18</sup> The fertility rate was 2.2 in 2016, and the average household size is 3.8 people.<sup>19</sup> Youth unemployment is high at 21.5 percent in 2019 (for the age group 15 – 24 years), with a higher rate for female youth (28.7 percent) than for male youth (17.6 percent). The country has made good progress on addressing poverty and development in recent decades. However, moderate poverty remains a challenge, as nearly one in four people live on USD 2.50 per day, just above the poverty line. Pockets of deeper poverty persist in the dry zone, central areas and isolated regions such as the Moneragala District and the estates (plantations). The high proportion of those employed but still living in poverty, gender disparities and scarce and unequal access to services and the labour market indicate a need for sustained and equitable economic engagement and market development in these areas.<sup>20</sup> The Gini coefficient was 39.80 in 2016, having reached a maximum value of 41.00 in 2002 and a minimum value of 32.40 in 1990.<sup>21</sup>

<sup>10</sup> MoE (2014) National Action Programme for combatting land degradation in Sri Lanka 2015-2024.

<sup>11</sup> MoEFCC (2015) 'Biennial Update Report to the UNFCCC'.

<sup>12</sup> <https://www.cbd.int/countries/profile/?country=in#facts> & <https://www.cbd.int/countries/profile/?country=lk#facts> accessed 28/01/2021.

<sup>13</sup> This is reported in several country communications to the three Rio Conventions (UNFCCC, UNCBD and UNCCD).

<sup>14</sup> <https://www.cbd.int/countries/profile/?country=lk#facts> accessed 28/01/2021.

<sup>15</sup> Sri Lanka Dept. of Census and Statistics, Statistical Abstract 2020.

<sup>16</sup> UNDP Human Development Report 2020.

<sup>17</sup> CBSL (2018). Economics and social statistics of Sri Lanka 2018. Central Bank of Sri Lanka.

<sup>18</sup> Climate Risk Country Profile: Sri Lanka (2020): The World Bank Group and the Asian Development Bank.

<sup>19</sup> Central Bank of Sri Lanka, Socio-economic data 2018.

<sup>20</sup> United Nations. 2017. United Nations Sustainable Development Framework 2018–2022. Colombo, United Nations System in Sri Lanka (*hereafter UNSDF*).

<sup>21</sup> World Bank Development Research Group data.

The economy of Sri Lanka is dominated by the service sector (61.7 percent of Gross Domestic Product [GDP] as of 2017), with major contributions from trade, transportation, and real estate activities. While the agricultural sector has shrunk in its contribution to GDP (7.8 percent as of 2017), it remains a significant employer (27 percent of the labour force in 2016).<sup>22</sup> Sri Lanka is nearly self-sufficient for rice<sup>23</sup>, the major crop. Other key crops include tea, rubber, and coconut, which collectively are cultivated over an area comparable with paddy rice (ca. 600,000–700,000 ha). About 1.8 million farm families are engaged in paddy cultivation; smallholders traditionally cultivate about 0.5 ha of irrigated or rainfed paddy land, along with a small amount of fruit and vegetables and chickens, pigs, goats and cattle or buffalo, and cultivation of fish in village-level water reservoirs.<sup>24</sup> Food crops such as pulses, oil crops, fibre crops, other cereals, yams, vegetables, and others are grown as rotation crops, on different land to the paddy land, for household use or for sale in local markets. The agriculture and forestry sectors rely on both traditional and modern technologies; neither sector is highly mechanized.<sup>25</sup>

The Dry Zone, the focus area of this project, is the agricultural heartland, covering 70 percent of the island's land area and providing many forms of agricultural employment. Two-thirds of Sri Lanka's cultivated areas are rain fed or irrigated by numerous minor reservoirs and diversions, collectively referred to as village irrigation schemes; over 15,000 of these are scattered across the Dry Zone. In the south-eastern parts of the Dry Zone, the poorest households depend almost exclusively on rainfall, while in other parts paddy rice is irrigated from the system of "tanks" or micro irrigation reservoirs. Farmers grow other field crops in the 'Yala' season when there is less rainfall; this has become more difficult as rains become more variable / reduced. Pockets of poverty and social exclusion are most prevalent in under-developed, rural districts of the Dry Zone<sup>26</sup>, where rehabilitation of community assets requires further attention.

**India** has an average population density of 382 per square km,<sup>27</sup> and ranks 131 out of 189 countries with an HDI of 0.65. Despite steady economic growth and great success in reducing multi-dimensional poverty,<sup>28</sup> with high levels of food insecurity, and malnutrition. These broad successes have not been shared equally or benefited all Indians. Much of India's poverty is concentrated in rural areas and in low-income states.<sup>29</sup> India remains a largely rural society, but is estimated that the urban population will increase from 31 percent of the total in 2011 to 40 percent by 2030.<sup>30</sup> The average household size of 4.2 persons shows slight variation, being 4.3 in rural India and about 3.9 in urban India.<sup>31</sup> 64 percent of the population is aged 15-59 years<sup>32</sup>. The unemployment rate among rural male youth (persons of age 15-29 years) was 16.6 per cent while the unemployment rate among the rural female youth was 13.8 per cent during 2018-19.<sup>33</sup> At 2.2 children per woman, the country is close to achieving the replacement level of fertility.<sup>34</sup>

India's economy, now the fifth largest in the world, has become increasingly diversified and stable over the past few decades. The largest economic sector by far is services, contributing 61 percent of GDP, but employing only 25 percent of the labour force; manufacturing and industry contributes 23 percent to GDP; while agriculture accounted for 15.4 percent of GDP, and employs 53 percent of the country's workforce.<sup>35</sup> The country has reached grain self-sufficiency. 70 percent of India's rural households still depend primarily on agriculture for their livelihood, with 82 percent of farmers being small and marginal.<sup>36</sup>

Odisha, the focus area of this project, is one of India's least-developed states and its eighth largest state, comprising 4.7 percent of India's land mass, 3.37 percent of its population (some 42 million people), and over 5 percent of its poor. Although poverty levels fell from 57 percent in 2004/05 to around 33 percent in 2011/12, the proportion of poor in Odisha remains well above the national average of around 22 percent. The rapidly growing economy (above national average) and rapid urbanisation of many agglomerations too pose a challenge for

<sup>22</sup> Climate Risk Country Profile: Sri Lanka (2020): The World Bank Group and the Asian Development Bank.

<sup>23</sup> <http://www.statistics.gov.lk/Agriculture/StaticInformation/PaddyStatistics/SelfSufficiencyInRice>

<sup>24</sup> ADB (2016) Sector Assessment for ANR in Sri Lanka, Country Assistance Program Evaluation.

<sup>25</sup> Climate Risk Country Profile: Sri Lanka (2020): The World Bank Group and the Asian Development Bank.

<sup>26</sup> Such as Puttlam, Anuradhapura, Kurunegala, Polonnaruwa, Moneragala.

<sup>27</sup> 2011 Census data: [http://www.dataforall.org/dashboard/censusinfoindia\\_pca/](http://www.dataforall.org/dashboard/censusinfoindia_pca/) accessed 03/02/21.

<sup>28</sup> NITI Aayog (2019) 'Localising the SDGs: early lessons from India 2019'.

<sup>29</sup> NITI Aayog (2019) 'SDG dashboard and index'.

<sup>30</sup> United Nations. 2014. World Urbanization Prospects: 2014 Revision. <https://esa.un.org/Unpd/Wup/Publications/Files/WUP2014-Report.pdf>

<sup>31</sup> MoSPI (2019) 'Periodic Labour Force Survey Annual Report, July 2017 – June 2018'.

<sup>32</sup> MoEFCC (2019) 'Biennial Update Report to the UNFCCC'.

<sup>33</sup> MoSPI (2020) Periodic Labour Force Survey, July 2018 – June 2019.

<sup>34</sup> UNFPA Country Programme for India 2018-2022.

<sup>35</sup> <https://www.investindia.gov.in/team-india-blogs/service-sector-india-paradigm-shift> accessed 03/02/21.

<sup>36</sup> FAO (2018) India Country Strategy.

addressing climate change.<sup>37</sup> The state has the largest number of Particularly Vulnerable Tribal Groups (PVTG), who are the poorest and most vulnerable of the Scheduled Tribes (STs).

Thus, the targeted project localities in both Sri Lanka and India share similarities in socio-economic characteristics, with a strong dependence on agriculture and thus high natural resources dependency, and with pockets of poverty concentrated in the more under-developed rural districts.

## Gender inequalities

Sri Lanka ranks 90 (out of 189) on the 2019 Gender Inequality Index (GII), while India ranks of 123.

**Table 1 Gender Inequality Index<sup>38</sup>**

HDI rank	Country	Gender Inequality Index		SDG3.1	SDG3.7	SDG5.5	SDG4.4		Labour force participation rate	
		Value	Rank	Maternal mortality ratio	Adolescent birth rate	Share of seats in parliament	Population with at least some secondary education		Labour force participation rate	
				(deaths per 100,000 live births)	(births per 1,000 women ages 15–19)	(% held by women)	(% ages 25 and older)		(% ages 15 and older)	
		2019	2019	2017	2015-2020 <sup>b</sup>	2019	Female	Male	Female	Male
72	Sri Lanka	0.401	90	36	20.9	5.3	79.2	81.0	35.4	74.6
131	India	0.488	123	133 <sup>k</sup>	13.2	13.5	27.7	47.0	20.5	76.1

Overall life expectancy at birth in Sri Lanka is 77 years, with females having a higher life expectancy of 78.6 compared to 72 years for males (calculated between 2011 and 2013).<sup>39</sup> Out of the 8.6 million economically active population, 64 percent are males and only 35 percent are females. Women constitute 52 percent of Sri Lanka's population but make up only 5.3 percent of representatives in parliament. Despite Sri Lanka's achievements in human capital development that favour women, such as high levels of female education and low total fertility rates, the low female labour force participation rates persist. These are caused by a combination of household roles and responsibilities; women not acquiring the proper skills demanded by job markets; and gender bias in hiring procedures.<sup>40</sup> Women are more likely than men to be facing multidimensional poverty and near multidimensional poverty.<sup>41</sup> Gender inequalities are likely to be higher in parts of the Dry Zone, where there is a larger number of women headed households (reportedly 30 percent, compared to a national figure of 22 percent of all households),<sup>42</sup> and a greater proportion of women taking care of people with disabilities and chronic diseases (especially the high incidence of chronic kidney failure affecting male farmers in the north and north central regions).

Life expectancy at birth in India is 69.7 years, with females achieving 71.46 years and males at 68.37.<sup>43</sup> Females constituted 48.59 percent of the population in 2016.<sup>44</sup> India's rank of 123 on the GII reflects the ongoing need to improve gender equality, as women do not benefit equally in economic opportunities, or in parliamentary representation (Table 1). The increase in the literacy rate to 77.7 percent in 2017 from 72.98 percent in 2011 has not yet closed the gap between male (84.7 percent) and female (70.3 percent) literacy;<sup>45</sup> nor between the urban and rural areas. In the latter, the literacy rate was 80.7 per cent among males compared to 64.5 per cent among females.<sup>46</sup>

Despite positive development gains, the project localities in Sri Lanka and India share similar characteristics with respect to gender inequalities, with women more likely than men to be poor. While at the national level Sri Lanka has a higher score on the GII, the above analysis reflects the need for more progress on gender equality in the rural districts of the Dry Zone.

## Effects of the Covid-19 pandemic

<sup>37</sup> Odisha Forest and Environment Department (2018) Odisha State Action Plan on Climate Change 2018-2023.

<sup>38</sup> <http://hdr.undp.org/en/composite/GII> accessed 02/02/2021

<sup>39</sup> <http://www.statistics.gov.lk/GenderStatistics/StatisticalInformation/Population/LifeExpectancyatBirthbySex1920-1922to2011-2013> accessed 01/02/2021.

<sup>40</sup> Solotaroff, Jennifer L., George Joseph, Anne T. Kuriakose, and Jayati Sethi. 2020. *Getting to Work: Unlocking Women's Potential in Sri Lanka's Labor Force*. Directions in Development. Washington, DC: World Bank.

<sup>41</sup> FAO. 2018. Country Gender Assessment of Agriculture and the Rural Sector in Sri Lanka. Colombo.

<sup>42</sup> Sri Lanka: Strengthening the Resilience of Post Conflict Recovery and Development to Climate Change Risks in Sri Lanka." [www.undp.org](http://www.undp.org). <https://info.undp.org/docs/pdc/Documents/LKA/SCCF Approved Prodoc.pdf>.

<sup>43</sup> Projected for 2016-2020 period; Report Of The Technical Group On Population Projections, Nov 2019, MoHFW.

<sup>44</sup> MoSPI (2019) 'Men and women in India'.

<sup>45</sup> MoSPI (2019) 'Men and women in India'. [http://www.mospi.nic.in/sites/default/files/publication\\_reports/Women\\_and\\_Men\\_31\\_%20Mar\\_2020.pdf](http://www.mospi.nic.in/sites/default/files/publication_reports/Women_and_Men_31_%20Mar_2020.pdf)

<sup>46</sup> MoSPI (2019) 'Periodic Labour Force Survey Annual Report, July 2017 – June 2018'.

In 2020 South Asia entered into its worst-ever recession due to the devastating impacts of COVID-19, taking a disproportionate toll on informal workers and pushing millions of South Asians into poverty. Many of the people who have been worst affected are also those who are more vulnerable to climate change – such as the rural poor who depend primarily on the climate-sensitive agricultural sector. Regional growth was expected to contract by 7.7 percent in 2020, after topping 6 percent annually in the past five years.<sup>47</sup> The projected rebound to 4.5 percent in 2021 will not offset the lasting economic damage caused by the pandemic; when population growth is factored in, income-per-capita in the region will remain 6 percent below 2019 estimates.<sup>48</sup>

India's economy, the region's largest, was expected to contract by 9.6 percent in the fiscal year that started in March 2020. The GoI has reported a V-shaped recovery since June 2020, with the ongoing vaccination scheme expected to further spur economic recovery.<sup>49</sup> Sri Lanka's economy was already showing signs of weakness before the COVID-19 pandemic. After growing by 2.3 percent in 2019, the economy contracted by 1.6 percent year-on-year in the first quarter of 2020. The contraction, a first in 19 years, was driven by weak performances of construction, textile, mining and tea industries. The economy was expected to contract by 6.7 percent in 2020, with all key drivers of demand affected: exports, private consumption and investment<sup>50</sup>. Private consumption, traditionally the backbone of demand in South Asia and a core indicator of economic welfare, will decline by more than 10 percent, further spiking poverty rates.

The COVID-19 crisis is believed to have caused sharp jobs and earnings losses, as well as market instability and disruption. The lower middle-income \$3.20 poverty headcount in Sri Lanka is projected to increase from 8.9 percent in 2019 to 13 percent in 2020. In India, the same measure is projected to increase from 40.9 percent in 2019/2020 to 46.2 percent in 2020/2021<sup>51</sup>. While childcare and eldercare responsibilities have increased for everyone during the lockdown, women – who are often more vulnerable to climate change - have disproportionately felt the burden of increased care work.<sup>52</sup>

### Health, nutrition and food security

South Asia has particularly high levels of stunting and wasting in children, with nearly 56 million stunted and more than 25 million wasted.<sup>53</sup> In the 2020 Global Hunger Index, Sri Lanka ranks 64<sup>th</sup> (score of 16.3, moderate level of hunger) and India ranks 94<sup>th</sup> (score of 27.2, serious level of hunger) out of the 107 countries with sufficient data.<sup>54</sup>

**Sri Lanka** has made progress towards Sustainable Development Goal (SDG) 2 – for example, the three-fold increase in per capita income and overall reduction in poverty over the past decade has improved economic access to food.<sup>55</sup> The country is nearly self-sufficient in rice, the staple food, and animal protein products such as fish and poultry, of which it produces more than 97 percent of its needs.<sup>56</sup> Nevertheless, Sri Lanka has one of the highest rates of acute moderate malnutrition (wasting) in the world – 15 percent prevalence – which WHO defines at the “critical” threshold level. Both the rates of wasting and stunting remain unchanged from 10 years ago, with stunting at 17 percent and continuing to affect optimal physical and mental development. Micronutrient deficiencies, especially anaemia, also remain a concern as they affect all age groups. Overnutrition is rapidly emerging, with 45 percent of women of reproductive age overweight or obese.<sup>57</sup> Approximately one third of the population in the Northern and Uva Provinces (including in the estate sector) and half in the Eastern Province cannot afford the minimum cost of a nutritious diet. Rising commodity prices, partially attributable to increasing production costs, disproportionately affect women and the poor.<sup>58</sup>

**India** has had some remarkable successes with respect to food security in recent years. It is home to the world's three largest food-based safety nets and effective disaster management systems, and has achieved self-sufficiency in grain production. However, one quarter of all the world's undernourished people still live in India. Between 2014 and 2019, food insecurity in India increased by 3.8 percent.<sup>59</sup> Poor rural households spend more

<sup>47</sup> World Bank (2020) Beaten or broken? Informality and Covid. South Asia Economic Forecast Fall 2020.

<sup>48</sup> World Bank (2020) Beaten or broken? Informality and Covid. South Asia Economic Forecast Fall 2020.

<sup>49</sup> Indian Department of Economic Affairs, Monthly Economic Review, December 2020.

<sup>50</sup> <https://openknowledge.worldbank.org/bitstream/handle/10986/34517/9781464816406.pdf>

<sup>51</sup> World Bank (2020) Beaten or broken? Informality and Covid. South Asia Economic Forecast Fall 2020.

<sup>52</sup> South Asia Gender Innovation Lab, Policy Brief, August 2020.

<sup>53</sup> FAO, UNICEF, WFP and WHO. 2021. *Asia and the Pacific Regional Overview of Food Security and Nutrition 2020: Maternal and child diets at the heart of improving nutrition*. Bangkok, FAO. <https://doi.org/10.4060/cb2895en>

<sup>54</sup> <https://www.globalhungerindex.org> accessed 26Jan21.

<sup>55</sup> Independent Review. 2017. National Strategic Review of Food Security and Nutrition Towards Zero Hunger. Colombo.

<sup>56</sup> WFP Sri Lanka Country Strategic Plan, 2018-2022.

<sup>57</sup> Sri Lanka DHS 2016.

<sup>58</sup> WFP Sri Lanka Country Strategic Plan, 2018-2022.

<sup>59</sup> FAO, IFAD, UNICEF, WFP and WHO. 2020. *The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets*. Rome, FAO.

than 60 percent of their incomes on food<sup>60</sup> and have limited access to diversified foods such as pulses, vegetables, milk and fruits. In some large states such as Assam, Bihar, Chhattisgarh, Madhya Pradesh, Odisha, Jharkhand and Uttar Pradesh, more than 30 percent of the population lives below the calorie-based poverty line<sup>61</sup> and the rates of reduction in malnourishment are very low. 38.4 percent of children under 5 are stunted and 21 percent wasted; according to the World Health Organization (WHO) classification, these rates are at “very high” and “emergency” levels, respectively. Although there are no significant differences between genders in malnutrition rates among children, higher mortality rates among girls and the fact that there are more boy children than girl children are indicative of serious bias against girls at the household level. The prevalence of micronutrient deficiencies is also high, with anaemia affecting more than half of women aged 15–49 years and of children aged 6–59 months and 22.7 percent of men aged 15–49 years. The double burden of malnutrition is on the rise, with 20.7 percent of women and 18.6 percent of men being overweight or obese.

Covid-19 is expected to worsen the overall prospects for food security and nutrition, potentially affecting areas and groups of people not traditionally affected by food insecurity. Immunization, nutrition and other vital health services have been severely disrupted by the pandemic, which potentially threatened the lives of up to 459,000 children and mothers in South Asia over the last six months of 2020.<sup>62</sup>

## Climate Change Vulnerabilities, Impacts and Risks

### Climate trends and projections

#### Observed trends

Analysis of past data suggests that **Sri Lanka** experienced warming of around 0.8°C over the 20th century (based on the Berkeley Earth dataset), which accords with the temperature rise reported in Sri Lanka’s NC2 of 0.16°C of warming per decade between 1961–1990.<sup>63</sup> Rates of increase vary across locations, but have become faster in recent decades. Mean daytime maximum and mean night-time minimum air temperatures also have increased, with the latter contributing more to the average increase in annual temperature.<sup>64</sup> Although total annual rainfall (past 10 years compared to the 30-year average) remains steady<sup>65</sup>, the variability of the monsoon, including seasonal onset and duration, was observed to be increasing. The number of consecutive dry days has increased, while consecutive wet periods have decreased.<sup>66</sup> The observed trends for maximum one-day and 5-day heavy rainfall events, as well as total precipitation on extreme rainfall days, are increasing, indicating increasing rainfall intensity.<sup>67</sup> In **India**, the annual mean temperature for the period 1901-2017 has also shown a significant increasing trend of 0.66°C per hundred years.<sup>68</sup> Over the past four decades, the mean annual minimum temperature shows a significant warming trend of 0.20°C/10 years. For the period 1961-2013, the all-India frequency, total duration, and maximum duration of heat waves have increased during the summer season; this is also true for the north west and the east coast.<sup>69</sup> Odisha has recorded below-normal rainfall across all districts since the 1960s. The “normal” 120 days of monsoon rain has shrunk to 60-70 days, and unusual spikes in rainfall, with torrential rainfall of over 200-250 millimetres/day, are more frequent during the monsoon, frequently resulting in floods.<sup>70</sup>

#### Projected changes

Projections for South Asia are for a rise in temperature of 2°C by 2050, which will exceed 3°C by 2100, accompanied by increased extremes in minimum and maximum temperatures.<sup>71</sup>

**Temperature** rise in Sri Lanka is projected to be marginally lower than the global average. Under the highest emissions pathway (RCP8.5) temperatures are projected to rise by 2.9°C–3.5°C by the 2090s, over the 1986–2005 baseline. In contrast, warming of 0.8°C–1.2°C is projected over the same time horizon on the lowest

<sup>60</sup> National Sample Survey Office. 2014. *Nutritional Intake in India 2011–12*.

<sup>61</sup> Government of India Planning Commission. 2009. *Report of the Expert Group to Review the Methodology for Estimation of Poverty*. [http://planningcommission.nic.in/reports/genrep/rep\\_pov.pdf](http://planningcommission.nic.in/reports/genrep/rep_pov.pdf)

<sup>62</sup> Unicef (2020) ‘Lives upended: how Covid-19 threatens the futures of 600 million South Asian children’. June 2020.

<sup>63</sup> Climate Risk Country Profile: Sri Lanka (2020): The World Bank Group and the Asian Development Bank.

<sup>64</sup> Climate Change Secretariat (2016) ‘National Adaptation Plan for Climate Change Impacts in Sri Lanka 2016-2025

<sup>65</sup> Punyawardena et al. Spatial Analysis of Climate Change Vulnerability. Natural Resources Management Centre, Dept. of Agriculture, 2012

<sup>66</sup> Premalal, 2009; Ratnayake and Herath, 2005).

<sup>67</sup> Recent Trends in Climate Extreme Indices over Sri Lanka January 2018 American Journal of Climate Change 07(04):586-599. DOI: [10.4236/ajcc.2018.74036](https://doi.org/10.4236/ajcc.2018.74036), Jayawardene et.al

<sup>68</sup> MoEFCC. (2018). India: Second Biennial Update Report to the United Nations Framework Convention on Climate Change. Ministry of Environment, Forest and Climate Change, Government of India.

<sup>69</sup> MoEFCC (2012) Second National Communication to the UNFCCC.

<sup>70</sup> Odisha Forest and Environment Department (2018) Odisha State Action Plan on Climate Change 2018-2023.

<sup>71</sup> Climate & Development Knowledge Network (CDKN). 2014. The IPCC’s Fifth Assessment Report: What’s in it for South Asia?

emissions pathway (RCP2.6).<sup>72</sup> Sri Lanka faces significant threat from extreme heat, with the number of days surpassing 35°C potentially rising from a baseline of 20 days to more than 100 days by the 2090s (under RCP8.5). In **India**, the annual mean surface air temperature rise by the end of the century ranges from 3.5°C to 4.3°C.<sup>73</sup> Under all emissions pathways, the rise in annual minimum temperatures is around 18-21% higher than the rise in average temperatures. Warming on higher emissions pathways is strongly biased towards the winter and pre-monsoon months.<sup>74</sup> The inland regions of Odisha, together with those of the other eastern coastal states of Andhra/Telangana and Tamil Nadu, are facing increased frequency of severe droughts, due to a combination of sustained heatwaves, higher rates of evapotranspiration and higher rainfall variability during monsoons.

**Rainfall** is projected to decrease across the drier regions of the northern, western and south-east coastline of India, and in the dry zone of **Sri Lanka**<sup>75</sup>. A higher percentage of annual rainfall is projected in the dry zones of Sri Lanka during the monsoon period while the inter-monsoon periods experience less rainfall with droughts expected to increase.<sup>76</sup> The number of days of more than 90th and 95th percentile rainfall will be increased in Dry/intermediate /wet zone in Sri Lanka till 2100 under the emission scenario RCP 4.5 (Moderate) and RCP 8.5 (high).<sup>77</sup> For **India**, the patterns of rainfall during monsoons are projected to spatially shift towards the already flood-prone coastal areas and away from the interior regions, inducing a major drought every 5-6 years,<sup>78</sup> with smaller dry spells every two years. More frequent and intense El Niño events will lead to more frequent heat waves of a longer duration. Several models indicate an increase in the rainfall intensity in the 21st century over most of the regions.<sup>79</sup>

### **Current and future vulnerabilities, risks and impacts of climate change**

The selected regions of both countries share many of the same climate risks and impacts, including increasing average temperatures, more frequent and intense heat waves, increased variability of rainfall from the south-west and north-east monsoons, as well as tropical cyclones originating from the Bay of Bengal. In Odisha, the combination of high poverty levels and high percentage of indigenous communities with high natural resource dependency make the state extremely vulnerable to climate change.<sup>80</sup> All the districts in Sri Lanka's Dry Zone that have been developing in recent decades have been battered by recurrent cycles of floods and drought in the last decade, with severe impacts on food security, nutrition, and income, particularly for those living in remote border districts.<sup>81</sup>

Rural farming communities in the target areas are heavily impacted by the changes in rainfall patterns, as their main livelihood is rainfed agriculture, mainly paddy cultivation. Land fragmentation and poor productivity are concerns in the dryland farming areas where land holding size generally ranges from 0.5 to 2.0 ha.<sup>82</sup> Agriculture is often complemented with inland fisheries in nearby micro irrigation reservoirs – also known in Sri Lanka as irrigation tanks. These micro irrigation reservoirs are dual purpose: they act as water retention during the rainy season and, with proper water management, can serve as irrigation during the dry season and also a source for inland fisheries. However, their structural integrity may be more often compromised with increased intensity of rainfall during monsoons, damaging their irrigation and retention potential. This would lead to inefficient water usage and a lower paddy harvest. Poor water retention capacity also leads to a decline in inland fisheries during the dry season and production of other crops including millets, pulses and oilseeds.

Environmental degradation impacts the already limited alternative income-generating opportunities in these localities. Desertification, which is land degradation in arid, semi-arid, and dry sub-humid areas, collectively known as drylands, has increased in range and intensity in South Asia over the past several decades.<sup>83</sup> Caused by

<sup>72</sup> Climate Risk Country Profile: Sri Lanka (2020): The World Bank Group and the Asian Development Bank.

<sup>73</sup> MoEFCC. (2018). India: Second Biennial Update Report to the UNFCCC.

<sup>74</sup> <https://climateknowledgeportal.worldbank.org/country/india/climate-data-projections> accessed 04/02/21.

<sup>75</sup> Number of days more than 90th and 95th percentile rainfall will be increased in Dry/intermediate /wet zone in Sri Lanka till 2100 under the emission scenario RCP 4.5 (Moderate) and RCP 8.5 (high). (Hapuarachchi H.A.S.U., Premalal S., 2020, Identify Extreme Rainfall Events for the Period 1991-2017 in Sri Lanka Using Percentile-Based Analysis and Its Projections for 2100 for the Emission Scenarios RCP 4.5 and 8.5, presented at the International Conference on Multi Hazard Early Warning System, 14-16 December, 2020, Colombo, Sri Lanka, Accepted to publish in Springer Journal)

<sup>76</sup> According to the joint Crop and Food Security Assessment Mission, drought conditions in 2016 and early 2017 led to widespread crop failures almost 40 percent less than the last year's output and 35 percent lower than the average of the previous five years.

<sup>77</sup> Hapuarachchi H.A.S.U., Premalal S., 2020, Identify Extreme Rainfall Events for the Period 1991-2017 in Sri Lanka Using Percentile-Based Analysis and Its Projections for 2100 for the Emission Scenarios RCP 4.5 and 8.5, presented at the International Conference on Multi Hazard Early Warning System, 14-16 December, 2020, Colombo, Sri Lanka, Accepted to publish in Springer Journal.

<sup>78</sup> ENVIS Centre of Odisha State of Environment <http://orienvic.nic.in/index1.aspx?lid=24&mid=1&langid=1&linkid=22>

<sup>79</sup> MoEFCC (2012) Second National Communication to the UNFCCC.

<sup>80</sup> Odisha Forest and Environment Department (2018) Odisha State Action Plan on Climate Change 2018-2023.

<sup>81</sup> GoSL and UNDP (undated) Technical Feasibility Report for GCF proposal 'Strengthening the resilience of smallholder farmers in the Dry Zone to climate variability and extreme events through an integrated approach to water management'.

<sup>82</sup> Ref. for Sri Lanka is GoSL and UNDP (undated) (see above).

<sup>83</sup> IPCC (2019) Chapter 3 on Desertification in the Special Report on Climate Change and Land, final draft.

intersecting factors, including human activities and climatic variations, this results in reduced agricultural productivity and incomes, as well as the loss of biodiversity.

In the targeted areas in India, agriculture is primarily rain-fed, with the majority of farmers dependent on the monsoon for irrigating their crops. Over-reliance on the monsoon poses uncertainties for food production and rural incomes as droughts, floods and variation in rainfall pattern greatly affect the agricultural sector. In Odisha, the frequent occurrences of extreme events are impacting on livelihoods and the state's food security – for example, in drought years, there is a considerable loss in production of pulses and oilseeds both during kharif and rabi.<sup>84</sup> The unique rainfall pattern of Tamil Nadu state compared to rest of India, and the poor water resources, render the state more vulnerable to drought and reduce per capita water availability. This drought-prone situation is similar to the north and east of Sri Lanka where droughts often also occur during the SW monsoon season. In the targeted areas in Sri Lanka, which have a bi-annual rainfall pattern, farmers cultivate both rain-fed and irrigated lands, using the over 40,000 minor irrigation reservoirs spread around the dry zone, which are owned and operated by the local farming community. In the Dry Zone districts, especially in the north, north centre, north-west and east, prolonged dry periods have limited access to safe drinking water. Limited recharging of groundwater during these dry periods, and contamination of drinking water sources due to high run-off and sedimentation associated with high intensity rainfall, further aggravate this.

Projected changes to the timing and amount of precipitation patterns may increase the potential for short-run crop failures and long-run production declines, posing a serious threat to food security. Although there will be a gain in some crops for some regions in South Asia, the overall impact of climate change on agricultural production is expected to be negative. The cumulative effect of climatic changes has already resulted in increasing frequency and intensity of droughts in the targeted regions, with negative results for agricultural production. Increased intensity of rainfall is leading to high levels of soil erosion that exacerbate land degradation and reduce productivity. At the same time, increased siltation downstream caused by soil erosion reduces the effectiveness of village irrigation systems. In certain districts in Sri Lanka, farming communities may have access to irrigation schemes but because of water scarcity due to reduced functioning of the systems, can only cultivate one crop per season. Other impacts of climate change on agriculture result from increased frequency of soil moisture stress, reduced availability of ground water, and saline intrusion in the coastal belt. Taken together, these will result in increased land degradation, more pest and disease outbreaks, and reduced agricultural yield (quantity and quality).

While vulnerability to increased droughts through climate change is widespread throughout Sri Lanka, it is concentrated in the Dry and Intermediate Zones.<sup>85</sup> Changes in northeast monsoon seasonal rainfall compare to the base line climatology, clearly indicate that negative rainfall anomaly especially in the dry zone will be fallen with the time under both high as well moderate emission scenarios. Reduction in northeast monsoon rainfall (December-February) may increase vulnerability of the agriculture sector as nearly 70% of the Paddy cultivate is collected during the Maha season (September to March) in the dry zone of Sri Lanka. Droughts are expected to increase, especially in the dry and intermediate zones<sup>86</sup>. In the most vulnerable Divisional Secretariat Divisions (DSDs), farmers on average, earn 63 percent of their income from agriculture. In the Dry Zone districts, especially in the north, north centre, north-west and east, prolonged dry periods have limited access to safe drinking water. Limited recharging of groundwater during these dry periods, and contamination of drinking water sources due to high run-off and sedimentation associated with high intensity rainfall, further aggravate this. There is often insufficient water for domestic consumption, and water sources are often not available in close proximity to where people live. Reduced recharge of groundwater concentrates minerals in the available water to levels well above those recommended for potable water. Similarly, accumulated pollutants from human activities tend to be concentrated during dry periods. The heavy floods that have followed some of the prolonged dry periods have led to runoff that has resulted in erosion and loss of soil nutrients, compelling farmers to apply increasing amounts of inorganic fertilisers. This increases the concentration of pollutants in the water during the dry season, creating a continuing vicious cycle of drought, floods and ground and surface water contamination.

Over 50 percent of South Asians, or more than 750 million people, have been affected by at least one climate-related disaster in the past two decades. Between 1970 and 2008, some 230,000 people were killed and USD 45 billion in damages caused. Estimates are that losses in the region will total USD 215 billion annually each year by

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<sup>84</sup> Odisha Forest and Environment Department (2018) Odisha State Action Plan on Climate Change 2018-2023.

<sup>85</sup> Anamaduwa (Puttalam District), Ambalantota (Hambantota District), and Polpithigama (Kurunegala District) were found to be the most vulnerable DSDs in the Climate Change Vulnerability Data Book of the Ministry of Environment, Sri Lanka (2011).

<sup>86</sup> Observed Climate trends, future climate change projections and possible impacts for Sri Lanka: Center for Climate Change Studies, Department of Meteorology, Sri Lanka

2030.<sup>87</sup> Both countries are already experiencing increased frequency and intensity of droughts and floods, which is affecting quantity and quality of production and the viability of agricultural livelihoods. For example, in Sri Lanka, the agriculture sector showed a negative growth rate of 4.2 in 2016 as a result of a combination of severe drought and heavy rains with flooding.<sup>88</sup> During 2010 - 2015, Sri Lanka suffered from a cycle of hydro-meteorological disasters that impacted mainly the Northern province of the Dry Zone, with droughts and flood incidents in quick succession, within a few months of each other, alternated within the same districts, affecting the same vulnerable communities and eroding their capacity to cope.<sup>89</sup> India experiences various types of natural hazards including cyclones, depressions, heavy rainfall, thunderstorms, hailstorms, floods, droughts, earthquakes, landslides, heat and cold waves, and tornadoes etc. About 80 percent are hydro-meteorological in nature.<sup>90</sup> India was among the five countries most frequently hit by climate-related disasters between 2002 and 2013.<sup>91</sup> Many parts of India are vulnerable to floods during the monsoons, which cause significant loss of life and damage to livelihood systems, property, infrastructure and public utilities. Flood risk has increased significantly over India during the recent decades.<sup>92</sup>

The combination of changed average conditions and increased extreme weather events is resulting in the growing climate risks in the target regions in both India and Sri Lanka. The particular vulnerability of the Indian State of Odisha to climate change lies in the combination of impacts of increased average temperature, decreased and more erratic rainfall, sea level rise, increased storm intensity, extreme droughts and heat waves, and increased wind and rainfall events.<sup>93</sup> Gradual sea level rise and associated effects in both countries are projected to cause long-term damage to coastal settlements, infrastructure, and livelihoods, and to exacerbate migration. The Dry Zone of Sri Lanka is highly vulnerable to a prolonged dry season, and facing reduced precipitation from the seasonal monsoon rains, which risks adversely impacting food security, as it contributes 70 percent of national paddy cultivation, which is the main food crop in Sri Lanka.<sup>94</sup> Sea-level rise is already impacting the lives and livelihoods of Sri Lankans along the coast through the salinization of soils and groundwater, and studies have documented the abandonment of coastal agriculture and degradation of water sources used for human consumption.<sup>95</sup> There is growing evidence that coastal hazards will be exacerbated by an increase in the average intensity, magnitude of storm surge and precipitation rates of tropical cyclones.<sup>96</sup> High-intensity tropical cyclones, including those forming in the Bay of Bengal, have been moving closer to coasts over the past 40 years, potentially causing more destruction than before.

Climatic changes are highly likely to worsen the current indicators for health, as well as food security and nutrition status in the targeted areas. Health-related effects of climate change in the target areas include direct impacts through increased heat stress, and increased incidence of vector- and water-borne diseases (e.g. malaria, dengue and diarrhoea), more injuries and loss of life through extreme events such as flooding and landslides (in the mountainous areas of Odisha), malnutrition and psychological problems. An epidemic of Chronic Kidney Disease (CKD) is occurring in the dry zone of the north central region of Sri Lanka, which is exceptionally hot.<sup>97</sup> This may be linked to poor water quality, which is dependent on water volumes in the tanks, and deteriorates during dry periods, and due to excessive use of fertilizer and agrochemicals, which are concentrated in water supplies and paddies during dry periods.<sup>98</sup> A similar epidemic of CKD in rural farmers (of rice, coconuts, and cashews) in Andhra Pradesh, India has also been observed.<sup>99</sup> Recent studies have also shown that recurrent heat exposure with physical exertion and inadequate hydration can lead to CKD that is distinct from that caused by diabetes, hypertension, or GN.<sup>100</sup> Health problems, including CKD, prevent farmers from productively engaging in livelihood activities, substantially increase family medical expenses, and weaken the rural economy and

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<sup>87</sup> <https://www.worldbank.org/en/events/2019/11/19/south-asia-hydromet-forum-ii> accessed 10Dec20.

<sup>88</sup> Department of Census and Statistics, 2016.

<sup>89</sup> GoSL and UNDP (undated) Technical Feasibility Report for GCF proposal 'Strengthening the resilience of smallholder farmers in the Dry Zone to climate variability and extreme events through an integrated approach to water management'.

<sup>90</sup> [https://www.clivar.org/sites/default/files/documents/CLIVAR%20Exchanges%2079%20Monsoon%20Mission%20Final\\_1231.pdf](https://www.clivar.org/sites/default/files/documents/CLIVAR%20Exchanges%2079%20Monsoon%20Mission%20Final_1231.pdf) accessed 02/02/21.

<sup>91</sup> United Nations Sustainable Development Framework (2018–2022)

<sup>92</sup> MoEFCC. (2018). India: Second Biennial Update Report to the United Nations Framework Convention on Climate Change. Ministry of Environment, Forest and Climate Change, Government of India.

<sup>93</sup> Odisha Forest and Environment Department (2018) Odisha State Action Plan on Climate Change 2018-2023; and reference below.

<sup>94</sup> Water Resource Management in Dry Zonal Paddy Cultivation in Mahaweli River Basin, Sri Lanka: An Analysis of Spatial and Temporal Climate Change Impacts and Traditional Knowledge

<sup>95</sup> Climate Risk Country Profile: Sri Lanka (2020): The World Bank Group and the Asian Development Bank.

<sup>96</sup> IPCC (2019) 'Special Report on the Oceans and Cryosphere, Summary for Policymakers'.

<sup>97</sup> With average temperatures of approximately 30 C, as quoted in Glaser et al (2016) 'Climate Change and the Emergent Epidemic of CKD from Heat Stress in Rural Communities: The Case for Heat Stress Nephropathy'. Clin J Am Soc Nephrol 11: 1472–1483, 2016. doi: 10.2215/CJN.13841215

<sup>98</sup> GoSL and UNDP (undated) Technical Feasibility Report for GCF proposal 'Strengthening the resilience of smallholder farmers in the Dry Zone to climate variability and extreme events through an integrated approach to water management'.

<sup>99</sup> Glaser et al. (2016) – as above

<sup>100</sup> Glaser et al. (2016) – as above.

farmers' ability to withstand losses from livelihood activities. These problems could be exacerbated through climate-change related reductions in water quality and quantity.

In general, undernutrition is exacerbated by the effects of climate change at all stages of the food value chain, through the following mechanisms: (i) reduced soil quality and water access; (ii) reduced crop and livestock productivity and biodiversity; (iii) micronutrient issues in staple foods as atmospheric CO<sub>2</sub> rises; (iv) increased issues for safety storage and transport of food feed; (v) reduced market access and incomes; and (vi) reduced access to and availability of nutritious food.<sup>101</sup> In India, scheduled tribes, scheduled caste communities, casual agricultural labourers and landless, small and marginal farmers<sup>102</sup> are among the most vulnerable populations to malnourishment, especially in women-headed households where sufficient access to a diverse diet is lacking.<sup>103</sup>

During drought years in the proposed project localities, the workload increases drastically both for the men and women in the targeted areas, but the new nature of workload affects the women most, as they are compelled to go out and perform non-traditional roles, leading to many challenges. When the men migrate in search of work, the temporary single status of women may lead to material and sexual exploitation of them on many occasions.<sup>104</sup> In times of drought and erratic rainfall, women and girls must walk farther and spend more of their time collecting water and fuel. Girls may have to drop out of school to help their mothers with these tasks, continuing the cycle of poverty and inequity. Climatic changes also affect the health of crops and livestock; and women, who are often responsible for producing the food eaten at home, must work harder for less food.<sup>105</sup>

Rising commodity prices, partially attributable to increasing production costs linked to climatic changes, disproportionately affect women and the poor. Higher food prices may lead poor households, particularly those headed by women, to resort to negative coping mechanisms such as limiting food consumption, prioritizing food for children (on average, every tenth household) and shifting to less-nutritious diets, with negative effects on health and nutrition.<sup>106</sup> Climate-related effects on nutrition include impacts on fisheries. Sri Lanka has a high dependency on fisheries for its national protein intake, and is also one of the most at-risk nations on earth in the fisheries sector: the projected potential decline in fish catch due to climate change is 20 percent by the 2050s.<sup>107</sup>

Under current global mitigation pledges and targets, climate change impacts will cause approximately 37.4 million people in the region will be displaced by 2030, and an estimated 62.9 million by 2050.<sup>108</sup> These numbers refer to migration linked to slow-onset impacts, namely sea-level rise, water stress, crop yield reductions, ecosystem productivity loss, and drought. They thus do not include the numbers of people who are likely to be displaced by sudden onset climate disasters such as flooding and cyclones, to which South Asia is particularly vulnerable. Some of the direct causes of internal migration in both countries are related to the impacts of climate change, specifically weather and climate-related disasters, and environmental degradation.<sup>109</sup> As resources begin to reduce, the increasing competition for obtaining them may also increase the likelihood of community disharmony.

## **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. At the national and sectoral level, Sri Lanka's high temperatures, unique and complex hydrological regime, and exposure to extreme climate events make it highly vulnerable to climate change. Key vulnerabilities lie in the agriculture, fisheries and water resources sectors, as well as significant risks to human health, human settlements and urban development, and in coastal zones.<sup>110</sup> The case of India is very similar, albeit at a larger scale. Multidimensional vulnerability as expressed on the Notre Dame Global Adaptation (ND-GAIN) Index is depicted in Figure 2.

### **Figure 2 ND-GAIN rankings for Sri Lanka and India**

<sup>101</sup> IFPRI & UNCSN (2017) Climate change and variability: what are the risks for nutrition, diets and food systems? IFPRI Discussion Paper.

<sup>102</sup> In India, marginal farmers are farmers who cultivate (as owners, tenants or sharecroppers) agricultural land of up to 1 ha (2.5 acres). Small farmers cultivate (as owners, tenants or sharecroppers) agricultural land between 1 and 2 ha (5 acres).

<sup>103</sup> WFP India Country Strategic Plan 2019-2023.

<sup>104</sup> Oxfam India and CYSD (2017) A review of Odisha State Action Plan on Climate Change: special focus on women and children.

<sup>105</sup> Oxfam India and CYSD (2017) A review of Odisha State Action Plan on Climate Change: special focus on women and children.

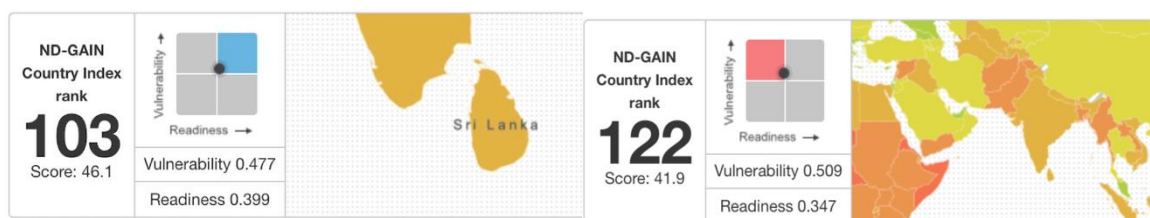
<sup>106</sup> WFP. 2012. Food Security in the Northern and Eastern Provinces of Sri Lanka – A Comprehensive Food Security Assessment Report, Sri Lanka 2012. Colombo.

<sup>107</sup> This estimate is based on the SRES scenario A1B, as documented in Barange et al (2014). Impacts of climate change on marine ecosystem production in societies dependent on fisheries. *Nature Climate Change*, 4(3).

<sup>108</sup> Singh et al, 2020, 'Costs of climate inaction: displacement and distress migration'. ActionAid report, Dec 2020.

<sup>109</sup> Understanding Migration Trends from Climate Change Affected Districts in Sri Lanka. IOM, WFP, FAO, October 2018.

<sup>110</sup> Sri Lanka National Climate Change Adaptation Strategy (2010); Sri Lanka NDC, 2016



Sri Lanka was ranked the 60th most vulnerable country and the 92nd least ready country out of 181 in the 2018 (most recent) ND-GAIN Index.<sup>111</sup> The ranking indicates that while it is on the road to responding effectively to climate change, the adaptation needs and urgency to act exceed current readiness. India was ranked the 48th most vulnerable country and the 70th least ready country, indicating a great need for investment and innovations to improve readiness and a great urgency for action. Both countries received high vulnerability scores for projected change in cereal yields, and for dam capacity, while a further area of concern for Sri Lanka was projected change in annual runoff.

### Barriers to adaptation

The selected regions of both countries share similar socio-economic vulnerabilities, as well as barriers that increase the difficulty of adapting to climate risks and impacts. Barriers to adaptation for the rural community members in the targeted areas include limited knowledge on adequate measures to address short- and long-term impacts of climate change and limited financial capacity to invest in adaptation measures.

Institutional barriers include limited capacity of extension services to provide climate and weather information that is easy to understand and actionable for farmers, in the form of localized agromet advisories, and to overlay these with relevant climate-smart practices /adaptive measures that are well suited for various production systems. The meteorological services in both countries have considerable expertise, but reliable and timely climate services through effective dissemination channels to inform more adaptive rural livelihoods are not yet sufficiently targeted, in terms of geographical, agro-ecological and production livelihoods systems, so that the range of user groups within communities can make well-informed ground-level decisions to protect their livelihoods and build their climate resilience.

Environmental degradation in the project localities acts as a further barrier to effective local-level adaptation. This encompasses rapid shrinkage of natural resources upon which agricultural livelihoods depend, such as, land, surface and ground water, soil health and biodiversity. Rapid deforestation is leading to increased soil erosion, watershed degradation and loss of valuable ecosystem services such as water purification and flood control, as well as reduced effectiveness of village water storage bodies through siltation.

Gender inequalities influence resilience and vulnerability to poverty, climate and other shocks and stressors, to the detriment of women. Gender-based barriers to adaptation are prevalent in rural farming communities in the targeted areas, where women often have a triple burden (productive, reproductive and community engagement), and their needs are often not addressed in adaptation planning. They seldom have access to and control over resources and decision-making power. Women have considerably less access than men to education and critical information on weather alerts and cropping patterns, affecting their capacity to respond effectively to climate variability.<sup>112</sup> In Sri Lanka, women are more vulnerable than men because they earn less, work longer hours, and are more likely to engage in unpaid labour (22 percent of the total female workforce), and have longer life expectancy (77.4 years compared with 71.2 years). Moreover, informal labour, including in the agricultural sectors, provides few or no social security benefits. Thirty-three percent of women work in the agricultural sector compared with 27 percent of men; women are therefore more vulnerable to climate shocks.<sup>113</sup> In India and Sri Lanka, as is the case in many countries, women usually perform the bulk of care work at home, including childcare, eldercare and other household activities, and are typically overrepresented in insecure forms of employment. One of the differentiated impacts of climate change on young women in India is that early marriage is an increasingly used coping mechanism in response to climate change-induced diminished agricultural livelihoods and resultant poverty, as households can gain dowry (wealth) in this way. This prevents young women

<sup>111</sup> <https://gain.nd.edu> accessed 27/01/2021. The Notre Dame Global Adaptation (ND-GAIN) Index is an annually updated multi-indicator cross-sectoral index that illustrates the comparative resilience of countries.

<sup>112</sup> Oxfam India and CYSD (2017) A review of Odisha State Action Plan on Climate Change: special focus on women and children.

<sup>113</sup> WFP Sri Lanka Country Strategic Plan, 2018-2022.

from furthering their education, subjects them to early childbearing and can incur damaging health, economic and agency impacts. Early marriage is no longer a developmental challenge in Sri Lanka.<sup>114</sup>

Gender and ethnic inequality remain intrinsic challenges that sustain malnutrition and food insecurity, to different degrees. In addition to gender, ethnicity is a further attribute that contributes to unequal access to wealth and opportunity in many countries in the South Asian Region. In India, the scheduled tribes, scheduled caste communities, casual agricultural labourers and landless, small and marginal farmers are among the most vulnerable populations in India, especially in households headed by single women where families lack sufficient access to a diverse diet.<sup>115</sup> Inequalities in intra-household food distribution disproportionately affect women and girls in India because socio-cultural norms dictate that they eat last and least, irrespective of age or health. Women often lack decision-making power with respect to food purchases, and boys are traditionally breastfed longer and receive more vitamin supplementation than girls.<sup>116</sup>

Many socio-cultural factors – including, inaccessible locations and high levels of poverty and vulnerability – pose challenges to achieving the goals and are frequently barriers to adaptation as well, as they increase vulnerability and reduce the adaptive capacity of the targeted populations. In both countries, the poorest people are most vulnerable to the impacts of climate and economic shocks, which are often interlinked. The considerable effects of the Covid-19 pandemic are increasing vulnerability and fragility of many households and individuals in the project areas, and are likely to exacerbate existing barriers to adaptation.

Increasing rural-urban migration reduces adaptive capacity and may act as a barrier to adaptation, as the rural areas lose important labour resources and experience a profound demographic shift. The patriarchal system combined with the nature of the rural exodus results in increased risks for women, girls, and members of woman-headed households, which may include from crime, exploitation, food insecurity and poor nutrition status, and the loss of household labour. Not all of these effects of the rural exodus necessarily apply in all of the project target localities. Community consultations confirmed high levels of out migration in the targeted areas, in which men have moved out of agriculture to other non-farm sectors as construction workers or in brick industries, while educated people migrate to other countries. In Sri Lanka, the rural exodus is perceived as being seasonal and temporary, with climate change as an underlying but not necessarily direct driver.<sup>117</sup>

Regional barriers to adaptation also impinge on the project areas. While some regional mechanisms exist to share common information, expertise and lessons learned between South Asian countries on climate services, currently these are mainly focused on the institutional governance level for comprehensive early warning and HydroMet/AgroMet systems. Regional linkages for developing and scaling out last mile access to timely and locally accurate climate information that is differentiated for specific livelihoods within the dryland areas have not been developed.

## **B. Project Objectives**

The project's main goal is to strengthen the climate change adaptive capacity and food security of vulnerable communities in Sri Lanka's dry zone and India's eastern coastal states, utilizing a regional, integrated approach. Leveraging differentiated skills and experience in the two countries, and using participatory and bottom-up approaches, the project will enable vulnerable groups to use last mile climate services to plan and implement targeted adaptation measures best suited for different livelihoods and localities, supplemented by livelihoods diversification and enhanced linkages to existing financial services. A regional feedback loop will provide valuable real-time lessons for scaling up and out, both within and beyond the two countries.

The project will achieve its goal through the following two objectives:

1. Strengthen access to reliable, timely and targeted last-mile climate services, and develop a system to co-produce, disseminate and scale up tailored agromet and hydromet advisories
2. Enhance the adaptive capacity of poor farming households, with a focus on women and vulnerable groups, to develop and implement local adaptation plans informed by climate advisories, resulting in improved practices, and diversified, climate-resilient livelihoods

The project will target smallholder farmers in the inland, dry areas of the project localities, with a focus on the needs and barriers of women and vulnerable groups. Specific targeting and the exact nature of the vulnerable

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<sup>114</sup> A UNICEF study of 2001 remarks on this phenomenon, and the fact that Sri Lanka is a country in South Asia that represents a success story in addressing the problem of early child marriage.

<sup>115</sup> Report: Food and Nutrition Security in India 2019, Ministry of Statistics and Programme Implementation and WFP

<sup>116</sup> Barcellos, S.H., Carvalho, L.S. and Lleras-Muney, A. 2014. Child Gender and Parental Investments in India: Are Boys and Girls Treated Differently? *Am. Econ. J. Appl. Econ.*, 6(1): 157–189. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3933178/>

<sup>117</sup> Rapid assessment report: “Understanding migration trends from climate change affected districts in Sri Lanka” – WFP, IOM, FAO October 2018.

groups will be determined through the development of localised vulnerability criteria during full proposal development. In Odisha, participants will include members of the PVTGs, who are overwhelmingly dependent on natural resources for their livelihoods such as rain-fed agriculture and gathering of Non-Timber Forest Products (NTFP). Each country will identify a limited number of the most vulnerable districts upon which implementation will be concentrated, to maximise impact on the ground.<sup>118</sup>

### C. Project Components and Financing

1. Enhanced effectiveness of last mile climate services to enable vulnerable communities to manage and adapt to climate variability and change	1.1 Strengthened capacities to ensure access to last mile climate services for vulnerable communities	1.1.1. National and sub-national level hydromet agencies and other stakeholders trained and equipped to co-produce tailored climate services for vulnerable groups  1.1.2 Strategy and feedback loop for the sustainable co-production and dissemination of tailored last mile climate services developed and validated through community engagement  1.1.3 Awareness raising sessions and technical training conducted for local government, service providers and local communities to access, understand and use climate information  1.1.4 Last mile climate services disseminated through identified, tailored and continuous communication channels, with feedback mechanism to ensure effectiveness	Sri Lanka and India	\$1,380,000
	1.2 Strengthened multi-level systems and regional knowledge sharing to develop and scale out tailored last mile climate services	1.2.1 Advocacy sessions and technical assistance provided to institutionalize co-production of last mile climate services in Sri Lanka and India  1.2.2 Regional knowledge sharing platforms leveraged for vertical and horizontal knowledge exchange and scaling out of tailored last mile climate services	Sri Lanka and India	\$1,500,000M
2. Community-based adaptation and diversified livelihoods enabled	2.1 Strengthened community-level capacities to develop and sustain adaptation plans	2.1.1 Community adaptation plans developed through participatory approaches to identify short- to long-term adaptation strategies  2.1.2 Linkages facilitated between community members and financial services for long-term sustainability of adaptation plans	Sri Lanka and India	\$1,500,000M
	2.2 Increased benefits to community members through implementing adaptation plans and diversifying livelihoods	2.2.1 Communities and households provided with technical assistance and resources to implement adaptation measures  2.2.2 Farmers trained and equipped to develop and implement diversified farm and non-farm livelihood options	Sri Lanka and India	\$7,400,000M

<sup>118</sup> The identification of districts will be based on climatological data, as well as poverty and other vulnerability criteria.

Project Execution cost	\$1,119,100
Total Project/Programme Cost	\$12,899,100
Project Cycle Management Fee charged by the Implementing Entity <sup>119</sup>	\$1,096,424
<b>Amount of Financing Requested</b>	<b>\$13,995,524</b>

## D. Projected Calendar

Milestones	Expected Dates
Start of Project/Programme Implementation	June 2022
Mid-term Review (if planned)	June 2024
Project/Programme Closing	May 2026
Terminal Evaluation	September 2026

## PART II: PROJECT / PROGRAMME JUSTIFICATION

### A. Project components

As a result of economic, social, environmental, climatic and other shocks, many vulnerable groups and individuals in the dry zone of Sri Lanka and India's dry eastern states are at risk of increased food and nutrition insecurity. This risk is exacerbated by currently inadequate coping capacities. The inter-linked vulnerabilities and barriers to climate change adaptation require targeted strategies to overcome them. The project components, outcomes and outputs developed to translate the project objectives into concrete actions will enable community members to make climate-risk-informed decisions and better plan their livelihood strategies over short-, medium- and long-term time frames. Improved access to financial services will help to ensure sustainability beyond the life of the project.

Through participatory and bottom-up approaches, the project will enable the use of targeted last mile climate and weather information packaged with agricultural advisories, to develop and adopt specific adaptation measures best suited for a range of livelihoods in different localities in the dryland areas, as determined by the needs of community members. Livelihoods diversification and enhanced access to financial services will promote sustainability of the proposed interventions. This will result in enhanced climate resilience and food security of vulnerable communities across the dry zone of Sri Lanka and the states in eastern coast of India, and provide valuable lessons for scaling out, both within and beyond the two countries.

#### **Component 1: Enhanced effectiveness of last mile climate services to enable vulnerable communities to manage and adapt to climate variability and change**

Climate services are defined as the provision of climate information to assist decision making by individuals and organisations.<sup>120</sup> Targeted climate information products, particularly concerning the seasonal rainfall and temperature conditions, are crucial for all the countries of South Asia. As major influencers of seasonal climate of the region, much effort has been put into better understanding and predicting with greater confidence the South Asian monsoons.<sup>121</sup> In general, however, there is still scope for improvement in terms of increased spatial and temporal resolution of forecasts up to block/village level in short to medium range, up to district level in extended range time scale and up to state/level in monthly and seasonal timescales. While all of these aspects are being addressed now in the ongoing and subsequent phases of the MM,<sup>122</sup> the IMD has confirmed that the element still missing is the provision of customised climate services to address agriculture and livelihood practices that change from area to area. The situation is similar for the dry zones of Sri Lanka, in terms of the lack of targeted and localised climate services; in addition, both countries currently experience a degree of disconnect between the

<sup>119</sup> Includes WFP Indirect Support Cost of 6.5%

<sup>120</sup> WFP (2020) Climate services for food security: guidance for WFP staff. December 2020.

<sup>121</sup> For example, under the Monsoon Mission (MM) Programme, the Indian Meteorological Department (IMD) has made significant advances in operational weather and climate forecasting, due to improvement and augmentation of dynamical NWP and climate models.

<sup>122</sup> Mohapatra et al. (2020), accessed on 02/02/21 at

[https://www.clivar.org/sites/default/files/documents/CLIVAR%20Exchanges%2079%20Monsoon%20Mission%20Final\\_1231.pdf](https://www.clivar.org/sites/default/files/documents/CLIVAR%20Exchanges%2079%20Monsoon%20Mission%20Final_1231.pdf)

meteorological forecasts and agricultural advisories provided, indicating the need for enhanced communication and integrated development of agro-meteorological advice (agro-met advisories) on the part of the line departments, as different levels.

Climate services involve the production, translation, transfer and use of climate knowledge and information. In order to respond to end-user needs, they require appropriate engagement between providers and users of climate information, together with effective access mechanisms. Consultations with villagers in the target areas confirmed that while they have access to generic climate information, such as seasonal forecasts, through mass media (TV and radio), this is not adequate to meet the challenges in the existing livelihoods. Smallholder farmers need access to reliable forecast information along with location-specific agricultural advisories at a shorter lead time than the seasonal forecast – for example, one to two weeks in advance, which would allow them to make risk-averse decisions on managing the homestead, their crops and livestock – such as planting drought- or flood-resistant varieties, making arrangements for fodder, etc.

In response to these identified needs, the project will develop a system for timely, reliable climate and weather information tailored to smallholder farmers' needs, as identified through community consultations and livelihood classification, packaged together with agricultural advisories – in other words, last mile climate services (LMCS). This is a key requirement to strengthen capacities to better plan for and manage climate variability and risk, and to adapt traditional practices so that they respond to changing climatic conditions. By linking into local level agrarian service centres, the project will harmonize the climate advisories with existing agricultural extension services promoted by them. Special attention will be paid to the needs of women and vulnerable groups, to ensure equitable access to LMCS.

Outcome 1.1 focuses on strengthening the capacities of national and sub-national level hydromet agencies, agriculture departments, intermediaries and other relevant stakeholders to co-produce tailored climate services for vulnerable groups, conducting awareness raising sessions and technical training for local government, service providers and local communities to access, understand and use climate information, and disseminating LMCS through identified and tailored communication channels. Outcome 1.2 is focused on strengthening multi-level systems and regional knowledge sharing to develop and scale out tailored LMCS, to provide a broader basis for developing climate-informed community adaptation solutions within the two countries and in the South Asian region. Outcome 1.2 thus reflects a break from the more *ad hoc*, 'pilot project' approach, to one that develops mechanisms for institutionalising and scaling up the bottom-up approach to co-producing LMCS, to ensure country ownership and long-term sustainability. Lessons learned in this regard will be shared at the regional level to promote learning and outreach across South Asian countries.

The term 'intermediaries' in this case means those who support the 'translation' of climate information into knowledge that is actionable (e.g. advisories). They generally act as filters across different disciplines, fields and sectors to assist in decision making, and include extension workers, non- governmental organisation (NGO) staff, community-based organisations (CBOs) and volunteers already working with local communities.

### **Outcome 1.1 Strengthened capacities to ensure access to last mile climate services for vulnerable communities**

#### **Output 1.1.1. National and sub-national level hydromet agencies and other stakeholders trained and equipped to co-produce tailored climate services for vulnerable groups**

Leveraging the comparative advantages and experiences of the two countries, the project will strengthen capacities of national and district level hydro-meteorological agencies, agricultural departments and extension services and key stakeholders to co-produce, disseminate and scale up tailored climate services, resulting in an effective and efficient multi-level system for LMCS, driven from the bottom up. The comparative strengths of the IMD and the Sri Lanka Department of Meteorology (DoM) will be harnessed to mutual benefit, through bi-national interaction and working in partnership, so that the necessary capabilities for the hydro-met services, as well as agricultural and other extension services and NGO or CBO intermediaries, so that all levels of the system for developing tailored LMCS are strengthened and made more coherent. The project will partner with different national and/ or international public and private sector entities for technical expertise and training government personnel to better understand issues related to climate variability, climate projections, and long-term impacts of climate change.<sup>123</sup> A detailed assessment of the needs and capabilities of the hydromet services to deliver LMCS

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<sup>123</sup> Potential partnerships are envisaged with the University of Reading and UK Meteorological Agency – this will be further discussed during the development of the full proposal.

will be carried out during preparation of the full proposal, to ensure the project actions are targeted and efficient.<sup>124</sup>

Output 1.1.2. Strategy and feedback loop for the sustainable co-development and dissemination of tailored last mile climate services validated through community engagement

Working with different government agencies, the project will formulate and validate through strong community engagement a strategy for the bottom-up co-development and dissemination of LMCS. This involves introducing community climate advisory services for last mile access to reliable climate and weather information, while strengthening technical capacities of local and other institutions to provide this information to communities. Part of the strategy involves developing a mechanism to streamline and improve information to be timely, succinct and geared towards specific actions to be taken, by coordinating with relevant agencies such as the Departments of Agrarian Development, Agriculture, Irrigation, Meteorology and Environment, as well as the Disaster Management Centre (DMC) in Sri Lanka and relevant disaster management (DM) authorities at different levels in India, on how best to effectively consolidate data into advisory products - simplified climate information in the format of key messages. An important aspect of this strategy is a mechanism for continuous feedback from end users, ensuring that information is tailored to the needs of community members in different localities and groups. This will be linked with a mechanism to monitor and ensure effectiveness of the climate services disseminated. Lessons learned from the current piloting of LMCS in Sri Lanka, and other successful relevant initiatives in India, will be integrated into implementation. The AF project will provide the opportunity to further develop and scale up the outputs and outcomes of the LMCS pilot project.<sup>125</sup> Decisions on most appropriate dissemination channels will also be informed by experience of the two countries – for example, the DOM has developed a mobile phone application (app) for marine fisheries with the Dialog mobile service provider, which could be replicated to disseminate localised agromet advisories to farmers.

Output 1.1.3 Awareness raising sessions and technical training conducted for local government, service providers and local communities to access, understand and use climate information

Consultations carried out to develop this CN showed that awareness raising of the benefits of agro-met advisories is needed. During community consultations in Matale district, dry zone division of Wilgamuwa, SL, the majority of farmers did not especially regard weather advisories as they do not receive detailed or localised information, but mainly more generic radio and TV broadcast of weather advisories. The project will additionally raise awareness of the effects of increasing heat stress, which has been identified as a gap during the consultations process, notwithstanding the expertise of the meteorological services in predicting heatwaves. Increased awareness of the longer-term climate projections will assist community members to make longer-term adaptation plans under Component 2.

In addition to raising awareness of the benefits of agro-met advisories amongst local community members, local level agriculture service centres / agrarian officers, intermediaries, and other relevant stakeholders will be trained to understand the forecasts, how to scale down the information to the agro-ecological context to promote food security and climate resilience, as well as how to identify media channels with strong rural outreach and develop simplified messages in local languages. Capacity strengthening training sessions for agrarian extension officers, officers of other agencies such as disaster management authorities, and community stakeholders will be conducted with technical support from national and/ or international partners to strengthen understanding of climate and weather information for food security and agriculture. This may be done through the Participatory Integrated Climate Services for Agriculture (PICSA)<sup>126</sup> or similar participatory approach for climate services and agricultural extension, and will be carried out through a partnership between the National Meteorological Services and Ministries of Agriculture/extension services. Part of the process will entail training agricultural extension workers, traditional communicators, and women and youth change agents on effective communication of climate information products and services.

Output 1.1.4 Last mile climate services disseminated through identified, tailored and continuous communication channels, with feedback mechanism to ensure effectiveness

Community consultations will be undertaken to understand the issues faced by the range of smallholder farmers and vulnerable groups in the project localities. This will include the impact of the changing climate on their livelihoods and understanding the weather or climate-related information they most need to enable them to

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<sup>124</sup> This could include for example improving the observation network in the project targeted areas through simple measures such as rain gauges; and capacity development on agrometeorology and seasonal prediction, taking into account differentiated needs of the meteorological services.

<sup>125</sup> This project is implemented by WFP and the departments of Agriculture and of Meteorology, and funded by the 2030 Fund.

<sup>126</sup> In partnership with University of Reading.

reduce, manage and cope with, and adapt to the changing climatic impacts, both in terms of changing averages as well as extreme events. This will include a focus on the neglected area of heat stress. The consultations will build on WFP's experience with climate services in different countries and regions, and in Community Based Participatory Planning (CBPP) and Seasonal Livelihood Programming (SLP) processes, as well as the experience of the GoSL and Gol and local service providers. Based on these findings, the relevant project partners – the departments of Agriculture and of Meteorology, NGO and other intermediaries, and WFP - will develop last mile climate advisories using agro-meteorological information, weather forecasts and drought impact analytics, with other national or, if needed, regional and international partners such as the Regional Integrated Multi-Hazard Early Warning System (RIMES).

Community consultations show broad demand for enhanced climate services, but dissemination will require careful planning. In some of the project areas, for example the dry zone division of Wilgamuwa in Sri Lanka, there is limited mobile network penetration and smart phones are virtually unavailable. All farmers said they would like to receive short term weather forecasts and seasonal predictions through the Agriculture Service Centres, through an offline method, but were not keen to pay for such a service. Activities under Outputs 1.1.2 and 1.1.3 will determine the most appropriate dissemination channels, with a learning loop so that these can be fine-tuned throughout the course of project implementation. This learning loop will be linked with a feedback mechanism to monitor and ensure effectiveness of the climate services disseminated. Appropriate dissemination channels will be selected, paying special attention to the development of local institutions and extension workers on how to best advise farmers so that they can make risk informed decisions.<sup>127</sup>

## **Outcome 1.2 Strengthened multi-level systems and regional knowledge sharing to develop and scale out tailored last mile climate services**

### *Output 1.2.1 Advocacy sessions and technical assistance provided to institutionalize co-production of last mile climate services in Sri Lanka and India*

To promote efficiency and effectiveness, and deepen national ownership of the project's outcomes, Output 1.2.1 will be implemented to advocate with the relevant range of government staff and other stakeholders in both of the countries for the institutionalization of the system of co-production of LMCS developed by the project. The existing regional forums mentioned above and below will be utilized to further engender willingness and support for this process. The project will promote the sharing of expertise between the two countries to achieve this output, and will additionally provide any necessary technical assistance so that the multi-level systems for climate services in each country are able to take on board and maintain the provision of LMCS in the project localities, and to over time extend this to all other areas of each country.

### *Output 1.2.2 Regional knowledge sharing platforms leveraged for vertical and horizontal knowledge exchange and scaling out of tailored last mile climate services*

The project will leverage and help to further develop regional knowledge sharing platforms for vertical and horizontal knowledge exchange and learning on enhancing tailored last mile climate services, and tools and systems for potential scale up in other countries. Lessons will be shared from the community level upwards through existing forums, enabling and sharing more broadly a learning-by-doing approach. In other words, regional stakeholders will benefit from emerging lessons from the project on developing and using LMCS for community-based adaptation throughout the lifespan of the project, rather than having to wait for final evaluations and lessons learned exercises at project closure.

Some regional mechanisms do exist to share common information, expertise and lessons learned between South Asian countries as part of south-south cooperation. These in general focus on long-term governance and strengthening institutional support for comprehensive early warning and HydroMet/ AgroMet systems at an institutional level. See Part II.G for a list of existing regional mechanisms, with which synergies will be developed. Building on these existing mechanisms, this regional project will encourage cross-border sharing of institutional knowledge and best practices in co-producing and delivering last mile climate advisory services, as well as lessons from the application of adaptation strategies to promote lasting resilience among communities facing climate variability and climate change, as implemented under Component 2. Existing regional forums will be used to facilitate the ongoing sharing of lessons from the different levels of the bottom-up system for LMCS, as well as community level exchange of best practices, including through the use of relevant technology. The project will

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<sup>127</sup> The project will also draw on lessons learned from the LMCS pilot project in Sri Lanka, in which delivery of climate information messages will be carried out by the Department of Agriculture, in partnership with WFP, the Department of Meteorology and other national and international partners, through the network of agrarian officers delivering door-to-door extension services. This project will also trial a range of different ICTs/channels, including existing live agri-radio broadcasts, text messages, and other applications as appropriate.

enhance bi-national and regional cooperation by strengthening sharing of information and expertise through existing regional cooperation mechanisms to prevent duplication of efforts, such as South Asian Seasonal Climate Outlook Forum (SASCOF), South Asia Hydromet Forum (SAHF), South Asian Association of Regional Cooperation (SAARC), and through other regional knowledge sharing platforms currently being developed / supported by the Asia Regional Resilience to a Changing Climate (ARRCC) project and the Climate Adaptation and Resilience for South Asia (CARE) project. This will facilitate rapid expansion and scale-up of successes and learnings.

## **Component 2: Community-based adaptation and diversified livelihoods enabled**

Building on the outputs of Component 1, Component 2 will support communities in the development and implementation of local-level adaptation plans and targeted adaptation options that respond directly to the current and future climate risks and projected impacts, ensuring meaningful participation of women and vulnerable groups throughout the process. The system of climate advisories developed under Component 1 will form an integral part of the adaptation planning carried out under Component 2, so that community members are empowered to take informed and risk averse decisions about adaptation options and their livelihoods.

Based on the needs and priorities identified in the local-level adaptation plans, the project will support smallholder farmers, with a focus on women and vulnerable groups, to implement their preferred adaptation solutions in the targeted drylands areas of the two countries, which have similar agro-ecological conditions and climate risks. Consultations have identified land and forest degradation and water availability/scarcity as critical issues that significantly undermine the viability of smallholder livelihoods and the increasing food insecurity in both countries. These issues are likely to become greater challenges under projected climate change, in the absence of concerted action to build resilience and diversify farming livelihoods. A further likely area of focus will be short- and long-term impacts of and potential solutions for the increasing heat stress that is affecting the project localities in an ever more serious way.

Community members will select their preferred adaptation solutions from a menu of appropriate adaptation options that will be developed during full proposal development. Community and stakeholder consultations have already identified some key areas for support that will form part of this menu of options, including restoring and rehabilitating traditional water provision systems and protecting their upstream catchments through land restoration / soil and water conservation measures. Directly addressing the gaps and priorities identified during the consultations process, the project will *inter alia* assist community members to restore and rehabilitate traditional water provision systems, such as the micro irrigation reservoirs (known as 'tanks' in Sri Lanka) and canals found in both countries, which have deteriorated in the past decades due to frequent floods, high run-off and siltation, as well as human-induced impacts such as encroachment and cultivation in the watershed, deforestation of local catchments, and unsuitable agricultural practices. This will of necessity involve landscape restoration and erosion control measures in the catchment areas upstream of the micro irrigation reservoirs, to be implemented as community-based interventions.

All project activities will be carried out under an explicitly stated and publicised sustainability / eco-agriculture approach. This will encompass restoring and maintaining ecosystems, rejuvenating forests, promoting integrated farming systems, and protecting and enhancing biodiversity. Awareness raising on the eco-agriculture approach will be carried out prior to or as part of the adaptation planning process, to enhance understanding of and build support for this approach. This will involve *inter alia* awareness raising on GAPS, water management, crop diversification and soil fertility management. An important element that directly addresses the current priorities of both governments will be to increase farmers' awareness of the link between forests, climate, agriculture and food security.

Working with community members in the most climate-vulnerable localities, the project will connect families with technical support and adaptation technology packages/equipment that will improve their agricultural production, asset base, climate resilience and food security, under differing livelihoods.

### **Outcome 2.1 Strengthened community-level capacities to develop and sustain adaptation plans**

#### **2.1.1 Community adaptation plans developed through participatory approaches to identify short- to long-term adaptation strategies**

The project will facilitate community members to plan and implement adaptation and resilience building assets, through an inclusive community-based process that includes awareness raising of the longer-term climate change impacts projected for the project localities. These adaptation measures will be designed to improve the natural resource base upon which the livelihoods of vulnerable communities depend, target the underlying drivers of malnutrition and food security, and increase their capacity to absorb weather shocks such as drought and

flooding, as well as adapt to longer-term changes such as increased average temperatures and increasingly erratic rainfall.

Community adaptation assets as well as individual adaptation options for households will be selected through a participatory local climate change action planning process, which will be informed and enabled by the evidence generated and the awareness and capacity developed under Component 1. Individuals in the targeted communities will be empowered to select the assets from a menu of potential options that has been developed to meet the needs of women, men, youth (female and male), and vulnerable groups within the target communities. The menu of adaptation options will be developed during the second round of community consultations, leading up to the development of the full project proposal. The participatory adaptation planning process will be informed by the experience of WFP and its partners in community-based participatory planning (CBPP), as well as that of government and non-government partners. Efforts will be made to link the adaptation planning process to existing statutory and/or customary local-level planning processes, to avoid creating a parallel system. Any supporting studies that might be needed to ensure sustainable and effective concrete adaptation measures under Output 2.1.2 will be identified through more detailed discussions with relevant agencies and service providers and carried out under Output 2.1.1 – for example, it may be necessary to carry out surveys to develop contour plans and area capacity diagrams for the micro irrigation reservoirs to be rehabilitated.

#### *Output 2.1.2 Linkages facilitated between community members and financial services for long-term sustainability of adaptation plans*

Communities will be supported in the implementation of the adaptation plans and in the development of financial strategies to ensure long term sustainability of the plans. To this end, the project will facilitate linkages between community members and existing financial services, so that individuals and community-based organisations such as farmer groups can enhance their access to microcredit and saving products, as well as existing microinsurance schemes. The project will encourage households and communities to build financial reserves through savings groups, including through linking them with relevant government entities.

The project could also facilitate linkages between beneficiaries and existing schemes that either primarily target addressing climate change adaptation needs, or schemes in which climate change adaptation still needs to be mainstreamed. Examples of the former in India are the Pradhan Mantri Fasal Bima Yojana (crop insurance scheme)<sup>128</sup>, Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)<sup>129</sup>, Pradhan Mantra Krishi Sinchai Yojana (watershed programme)<sup>130</sup>, Green Revolution - Krishonnati Yojana - Mission for Integrated Development of Horticulture<sup>131</sup>, National Rural Livelihood Mission<sup>132</sup>, Forestry (National Afforestation and Eco-Development<sup>133</sup>), and the Atal Mission for Rejuvenation and Urban Transformation<sup>134, 135</sup>. The MGNREGS, which is a cross-cutting scheme across departments, has already been successfully leveraged by other projects to support adaptation-related community assets – for example, the Paribartan project mobilized this for effective asset building at individual and community level.<sup>136</sup> The project would build on the social capital and institutions build under the National Rural Livelihood Mission (NRLM) schemes of India. Producer Groups and enterprises promoted under NRLM will be used as potential platform for training of the vulnerable groups on adaptation. In Sri Lanka, the GoSL has credit schemes with subsidized interest rates for farming, for micro/ small/ medium/ enterprises (MSME) to invest in agriculture, livestock and fisheries through state banks. In addition, private banks have agricultural loans for a variety of purposes. Despite these and other financial institutions and special projects providing financial services to the poor, smallholder farmers and vulnerable households frequently do not receive the information and guidance on how to mobilize the credit for a viable livelihood or agri-business. Improper use of the credit and lack of cash flow management are further issues. The project could provide basic financial literacy training to assist farmers or agri-MSMEs on issues they face such as keeping income and expenditure records to show the bank, etc.; and by connecting beneficiaries with business service providers/coaches to assist them to develop business plans. It could also provide support to credit providers for innovation to expand outreach. Differential experience could be shared between the countries – for example, India's experience and expertise on

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<sup>128</sup> <https://pmfby.gov.in/>

<sup>129</sup> <https://nrega.nic.in/netnrega/home.aspx>

<sup>130</sup> <https://pmksy.gov.in/>

<sup>131</sup> <https://midh.gov.in/>

<sup>132</sup> <https://aajeevika.gov.in/>

<sup>133</sup> <http://www.naeb.nic.in/contact.html>

<sup>134</sup> <http://amrut.gov.in/content/>

<sup>135</sup> In addition to these schemes, the Pradhan Mantri Jan Dhan Yojna<sup>135</sup> acts as the policy instrument of direct benefit transfers for various socio-economic transfers to the marginalized population of India.

<sup>136</sup> Concern Worldwide (2015) Paribartan Final Evaluation Report.

developing extension and support services at many banks (especially the government development banks), which was one of the success factors for dairy development in India.

## **Outcome 2.2 Increased benefits to community members through implementing adaptation plans and diversifying livelihoods**

### Output 2.2.1 Communities and households provided with technical assistance and resources to implement adaptation measures

Under Output 2.2.1, adaptation options selected by community members will be implemented at community and household level. The menu of adaptation options will include climate resilient agricultural, inland fisheries production, ecosystem-based infrastructure creation and sustainable water management approaches, for improved food security and climate resilience.

Community-based watershed and/or infrastructural works will centre around rehabilitation of the traditional systems of village reservoirs and irrigation that exist in the targeted areas – hereafter referred to as ‘**micro irrigation reservoirs**’. The micro irrigation reservoirs in the Dry Zone of Sri Lanka, classified in that country as ‘minor’ and known as ‘farmer-managed irrigation systems’,<sup>137</sup> have deteriorated in the past decades due to frequent floods, high run-off and siltation, as well as human-induced impacts such as encroachment and cultivation in the watershed, deforestation of local catchments and unsuitable agricultural practices.<sup>138</sup> The situation is similar in the Indian states of Odisha and Tamil Nadu. These combined effects have decreased water storage and hence the viability of village irrigation schemes to provide continuous water resources to farmer communities. Siltation due to intense rainfall events and evaporation losses due to high temperatures are more evident in small reservoir systems than in larger reservoirs.<sup>139</sup> In the traditional systems, conservation of the catchment was considered crucial for the sustainability of the village irrigation system, to improve water yield and storage throughout the year. These catchments are local forests and/or multi-use landscapes yielding fruit, fodder, firewood and other benefits to the community, but devoid of annual crops (vegetables etc).

The project will provide support for the rehabilitation of the micro irrigation reservoirs, which are usually community owned assets, and associated infrastructure. The micro irrigation reservoirs are distinct from farm ponds, which are very small rainwater harvesting structures, generally constructed by an individual farmer in his own land to irrigate his plot. Infrastructure for watershed management can include small earthen dikes constructed on the upstream watershed of the reservoir, silt trapping ponds on clearly defined water inflow paths, a tree girdle on the high flood level line, and planting the reservation on the downstream of the micro irrigation reservoir with suitable trees.

Each option on the menu of adaptation options will be assessed against a set of criteria that include adaptation impact, cost-effectiveness, appropriateness to the context and relevance for targeted communities. Specific options could include improvements to water management and harvesting, community-based natural resource management, introduction of agroforestry, green belts and infrastructure, ecosystem restoration, crop diversification and encouraging climate resistant crop and seed varieties including millets, and climate proofing of household and community assets. Alternate cropping could encompass both promoting alternative, more climate-resilient and nutritious crops such as millet, as well as crop rotation. Training on good agricultural practices (GAPs) will be provided, in line with the project’s emphasis on ecological agriculture. During implementation, emphasis will be placed on identifying and exploring specific adaptation options for responding to the increasing heat stress experienced in the project localities, at different temporal scales. At the community level, this could range from short-term behaviour change to reduce the risks to farmers from short periods of extreme heat in current agricultural livelihoods (e.g. planting more trees for shade, keeping better hydrated), to increasing income from agricultural livelihoods in the medium-term to address prolonged periods of extreme heat, to longer-term shifts towards non-agricultural livelihood systems. Conservation tillage, which not only improves the productivity of land but also increases the land surface albedo, thus reflecting most of the incoming solar radiation back into the atmosphere,<sup>140</sup> could also be promoted.

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<sup>137</sup> These systems consist of a small reservoir, with an associated irrigation command area of up to 80 hectares / 200 acres.

<sup>138</sup> In Sri Lanka’s dry zone, water stored in the micro irrigation reservoir is used for irrigation of paddy/rice cultivated in the downstream (low land) area in both major and minor rainy seasons. In the minor season, the cultivation extent is decided according to the water availability in the reservoir (generally less than 20 percent of land under minor irrigation reservoir can be cultivated during minor season). The other field crops, fruits and vegetables are primarily cultivated as rain-fed cultivation in the dry zone highlands (middle part of the catena/home states) during the major monsoon season. Ground water is used for irrigation during dry / minor season in the highlands of the dry zone. (Source: WFP SL CO)

<sup>139</sup> Aheeyar (2012)

<sup>140</sup> Odisha State Disaster Management Authority (2018) Heat Action Plan for Odisha.

In line with priorities of the GoI and the GoSL, the project will adopt a food for assets (FFA) / cash-based transfer (CBT) approach as an effective means to address natural resources degradation in the project areas, through soil and water conservation, flood and erosion control, agroforestry and other relevant ecosystem-based adaptation (EbA) approaches. WFP and its partners have considerable expertise in this approach, including in developing sound approaches to operations and maintenance of community assets, and regarding an exit strategy to ensure lasting outcomes.

In response to demand from stakeholders and community members, support will be provided for promotion of **an integrated farming system**, which combines different agricultural activities in a unit area of land to maximise returns, while maintaining soil status and fertility, as an important way to enhance climate resilience for small farmers. This element will build on existing experience, such as the integrated farming system model developed and piloted in one district of Odisha, funded by the State, with plans to scale up to three more districts, and a target of 500,000 farm ponds in five years. An integrated farming system utilises the by-products of one component as an input into another for ensuring supplementary and complementary enterprise relationship, and to reduce environment pollution. Components include crop production, farm pond, kitchen garden, pisciculture, poultry, apiculture, vermicompost, duckery, biopesticides, etc.

The project will also consider support for adaptation technologies that address widespread human-animal conflict, with a focus on human-elephant conflict. In 2019, 361 Asian elephants, which are listed as 'Endangered' on the IUCN Red List<sup>141</sup>, were lost in Sri Lanka, which is the highest loss since 1948. This is a particular problem in the dry zone, related to loss of forest cover and increasing drought; reduced access of wildlife to water in the dry season leads to increasing damage to farmers' fields. WWF has highlighted the link between climate change and human-elephant conflict in Asia.<sup>142</sup> Habitat loss, human-elephant conflict and poaching have the potential to increase due to the effects of climate stressors on humans and resulting changes in livelihoods, thus impacting further on the diminishing populations of Asian elephants.<sup>143</sup> Moreover, addressing this issue, which combines both climate- and non-climate drivers in an interlinked way, is a high political priority recently stated by the Cabinet of Sri Lanka. Possible solutions include clearing and protecting elephant corridors, conservation and restoration of forest cover, securing water supplies for elephants, and bio-fencing as well as ongoing community-level mechanisms such as inexpensive locally developed electrified fencing to keep elephants and other wildlife out of crops.<sup>144</sup> Similar problems have been reported in Odisha and Tamil Nadu, with the incidence of human-elephant conflict increasing over the last two decades, related to loss of habitat and agricultural encroachment.<sup>145</sup> Given the high daily amounts of water elephants need, and the increasing incidence of droughts in the project localities, human-elephant conflict is likely to increase as climate change deepens. The project will explore how to encourage traditional knowledge and local innovations to address these conflicts, as part of local-level adaptation strategies, in collaboration with conservation agencies in the areas. There are also opportunities for associated regional learning and knowledge exchange, as other areas in the South Asian region face similar challenges.

Implementation of Output 2.2.1 will address institutional and socio-cultural barriers such as low technical capacity of extension workers, lower access for farming communities to financial and technical services, particularly for women and the gender-based discriminations." The concrete adaptation activities will be nutrition-sensitive and gender responsive, by working to identify and address the underlying drivers of malnutrition related to livelihoods, knowledge and practices and gender and ethnic inequality. The impact of the climate resilience activities on women and vulnerable groups will be tracked using appropriate indicators, such as differentiated dietary diversity, and MDD-W (minimum acceptable diet for women).

#### Output 2.2.2 Farmers trained and equipped to develop and implement diversified farm and non-farm livelihood options

Given increased temperatures and the changing rainfall conditions, sustainable and longer-term adaptation will require diversification towards high value non-paddy crops is needed, and indeed this is already happening in the project areas, as well as a shift from farm to non-farm occupations. As inland fisheries are considered to have significant scope as an alternate livelihood, associated options for processing and marketing fish produce will be considered. Introducing value chain development for inland fisheries will enhance the income of farmers and help to compensate for loss of agricultural income.

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<sup>141</sup> Choudhury A et al., 2008. *Elephas maximus*. The IUCN Red List of Threatened Species.

<sup>142</sup> Advani, NK, 2015. WWF Wildlife and Climate Change Series: Asian elephant. World Wildlife Fund, Washington, DC.

<sup>143</sup> <https://www.worldwildlife.org/pages/asian-elephants-and-climate-change> , accessed 7<sup>th</sup> June 2021.

<sup>144</sup> E.g., a farmer in Moneragala district developed an inexpensive, locally made electric fence using one solar panel and a car battery, at a cost of less than USD75.

<sup>145</sup> Palita, Sharat Kumar & Purohit, Kamal. (2008). Human-Elephant Conflict: Case Studies from Orissa and Suggested Measures for Mitigation. 10.13140/RG.2.1.3326.6007.

The project will conduct a market assessment to determine viable alternative livelihoods, informed by longer term adaptation strategies. Furthermore, the project will explore further options to develop climate resilient livelihoods for farmers' communities, including improved storage facilities, introduction of post-harvest technologies, strengthening of market linkages, livelihood diversification (including non-farm), and skills training for non-farm livelihoods. Regarding farmgate level processing and marketing, this is considered to be particularly important for varieties like millets in Odisha. In Sri Lanka's dry zone, farmgate level processing for grains and legumes such as rice, maize, millets, mung bean, urid, sesame and peanut has high potential for primary processing. Products can be linked to local and export markets and for further processing with local industries. The project will include support for formation of farmer producer organization, self-help groups of women and supporting them in farmgate level processing and markets; as well as supporting youth and women to be change agents for more widespread dissemination and motivation on climate-resilient and diversified livelihoods. The project will explore the adaptation strategy value-add with respect to food processing units at farmgate level, export markets and broadening relevant partnerships; as well as of setting up of marketing channels beyond public procurement, as in the case of millets. The project will strengthen secondary agricultural systems by promoting non-farm skills, such as pickling, papad making, and cottage industries using the increased produce grown under Output 2.2.1, and improve associated market linkages. Any buildings developed by the project – for example storage or milling facilities – will be designed to be as heat resistant as possible, in addition to other climate resilience criteria (such as being low carbon and not being at risk from increased flooding).

The project will consider how to assist people who have lost their jobs through Covid – for instance, women with sewing skills who were retrenched from apparel factories. These women could be supported to produce and market small hand-woven items, possibly decorative cloth bags for high-value agricultural products that could be dried, and shopping bags, etc. Other ideas, for example, are to help women to produce strengthened traditional banana leaf 'gift wrap', as well as paper and bags from elephant dung. All of these items would replace plastic, so this environmental benefit could be used in the marketing process.

## **B. Promotion of new and innovative adaptation solutions**

The project will adopt a number of innovative approaches, technologies and mechanisms that facilitate new solutions to climate change adaptation and promote resilience amongst the smallholder farmers and vulnerable groups in the project areas.

A central and innovative element of the project is to introduce and promote scaling up of a bottom-up and evidence-based approach to adaptation at community level. Beginning at the community level, the project will introduce a community-driven system of co-production of climate and agricultural advisories, ensuring that women can play an equal role, that will enable smallholder farmers to strengthen their preparedness and risk management strategies against climate change, through reliable climate information. The system of gender-responsive, bottom-up, localised LMCS, delivered through digital technologies where appropriate, is different to the usual method of more top-down development of climate advisories by the meteorological services, which tend to be generalised down from, for example, the national seasonal forecast, and thus are not actionable in different localities and for different livelihoods systems. Many have tended to address the needs and access/capabilities of male farmers over those of women farmers. While the primary innovation is at the community level, project actions will build relevant capacities of the meteorological services, agricultural extension services, and a range of intermediaries at the sub-national and national level to co-develop agro-met advisories, resulting in an effective multi-level operation of the LMCS system. Moreover, demonstration of community-driven co-production will naturally create demand for replication in other places and thereby strong participation can be achieved at both top (national) and bottom (sub-national and community) level. This is innovative way to drive interest among communities and government agencies for gender-responsive LMCS. The focus on developing a system to institutionalise LMCS within the two countries, and share lessons of this through the regional mechanism, is an innovative way to sustain the benefits beyond the lifespan of the project. Many projects pilot activities in one particular place, with no provisions for institutionalization of any systems developed, and thus there is no trace of the benefits post-project.

A second innovative element related to the above is that the project will leverage regional advantages to combine an improved availability of last mile climate and weather data and related advisories. This will build *inter alia* on the comparative advantages of the IMD and the SL DoM and their partners in each country. Furthermore, the project will work with the relevant agricultural research institutes in both India and Sri Lanka, which have a vast domain of knowledge specific to the cropping systems or agroclimatological zones, and which also often have expertise with community engagement. Harnessing the combined and differentiated agricultural research expertise through the project's regional approach would greatly benefit both the countries. In addition, the project incorporates a regional feedback loop that is innovative in the manner in which it enables lessons from the

community and local level to be directly fed into a regional forum in a learning-by-doing approach. Through field reviews and case studies, smallholder farmers will be able to provide feedback on the value added and usefulness of the tailored climate and agricultural advisories, which will serve as lessons in real time as they will be disseminated via the regional forum, as well as for further scaling up of similar activities in each country.

Thirdly, the project has the potential to utilise a WFP innovation, the Platform for Real-time Impact and Situation Monitoring (PRISM), in the development of localised agro-met advisories in both countries. The PRISM platform assesses the potential risk and forecasts the impact of climate hazards on the most vulnerable communities, in order to design risk reduction activities and target disaster responses. PRISM enables WFP's partners in government and WFP country offices to access the latest available climate hazard information alongside vulnerability data through an intuitive, map-based dashboard. PRISM combines information from satellites and other remote sensing sources with WFP data on vulnerability to create actionable climate information for decision makers, allowing them to prioritize assistance to those most in need. This is designed to overcome the problem of lack of access to latest data and information on climate hazards and the people vulnerable to them. Should PRISM be used, this will build on the experience of the GoSL and WFP with the platform, and assist to spread the innovation to other countries in South Asia, via the learning and feedback links that will be instituted, via the AF project, with various regional forums. Sri Lanka has concrete experience with using PRISM, which is hosted at the Disaster Management Centre (DMC). The initial focus is on monitoring and assessing the impact of drought conditions (rainfall anomalies, standard precipitation index and vegetation health index), with plans to extend it to other hazards such as flooding and landslides, and to analyse the impact of climate shocks on food production.<sup>146</sup>

## **C. Economic, social and environmental benefits**

### Economic benefits

*Reduced crop losses and associated income through provision of targeted climate and agricultural advisories:* Through the project actions, smallholder farmers will benefit from timely climate information enabling them to plan and manage climate variability and risk. This will result in economic benefits in the form of avoidance of lost investments through crop failure, as well as maximised production under suitable conditions. The IMD has emphasised that efficient climate services, ranging from forecast a few hours hence forth to long-term forecast, with linked adaptation plans, can significantly reduce the input costs for the farmers. The project will incorporate indicators and methods to track reduced input costs and increased income, in order to gather data that could be used to motivate other initiatives to adopt this approach.

*Increased income for poor smallholder farmers through restoration and climate proofing of watersheds and village irrigation systems:* In Odisha, climate proofing of watershed projects has been undertaken to address risks in the agricultural value chain, which includes increasing community capacities and institutions – with the aim of doubling farmers' income. While this is still in the implementation phase, with no known evaluations, the project team will follow up during full proposal development to identify any quantitative evidence.

*Reduced costs of production through integrated farming system:* This system, in which a series of crops are integrated with other compatible activities like animal husbandry, farm ponds for fisheries, etc. helps in judicious use of resources while augmenting financial returns from all the activities. As the system has symbiotically-related activities, this reduces the recurring costs of cultivation, such as fertilisers, thereby maximizing profit as compared to a mono-cropped or single-activity-based system.

*Increased access to savings and microfinance:* The project will facilitate linkages with existing financial services. 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. This will allow individuals to become more resilient to both smaller and larger shocks, and to conserve and build their incomes and asset base over time.

*Reduced project transaction costs through the regional approach:* Since rural communities in target areas in Sri Lanka and India face common vulnerabilities and shared climatic risks, it will be cost-beneficial for both countries to sustainably build common climate resilient and last mile adaptation approaches to implement like technologies and practices among communities. These reductions in project transaction costs translate into more project funds that can be used to directly benefit poor smallholder farmers – thus, the project will be able to do more with less.

### Social benefits

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<sup>146</sup> Including market price monitoring, crop status and impact, irrigation data (reservoir and dam level), and district level impact analysis, with more sophisticated reporting.

*Enhanced community ownership and positive citizen-state relations:* By using a participatory approach that brings together communities, local government and key state entities like the Departments of Meteorology, Departments of Agriculture, Disaster Management Agencies and potentially the private sector and researchers, the project aims to foster positive citizen-state relations (vertical cohesion) and inspire a resurgence of trust and greater propensity towards community-level dialogue. The bottom-up approach of the project and strong participatory ethos will facilitate enhanced community ownership, which is likely to result in greater sustainability for project assets. It will also elevate the voices of community members from vulnerable and frequently marginalised groups in the provision of climate services and in planning and implementation of adaptation.

*Enhanced gender equality and increased agency for women through the project's gender focus:* A gender assessment will be carried out during project preparation to assess different needs and barriers of men, women, youth and their intersecting identities (age, abilities, location, ethnicity, language, gender, social class). Based on the outcomes of this and of further gender-sensitive consultations, project activities will be designed to accommodate women and people with different abilities while also considering their availability and care responsibilities. During project implementation, CBPP processes will be employed with active participation of women, youth, disabled and elderly, allowing their specific needs to be included in the adaptation plans. Particular attention will be given to ensure women's participation in decision making at community level, to enhance their agency and active leadership in climate change adaptation, as well as reduce dependency and vulnerability.

*Enhanced cultural resources and social cohesion through restoration of village irrigation systems:* Micro irrigation reservoirs / village tanks are described as the "pivot" on which the life in the Dry Zone revolves even in the modern times. The multi-purpose services provided by these reservoirs in both India and Sri Lanka range from economic purposes such as irrigating the command area, social purposes such as domestic use (drinking, bathing and washing), meeting livestock needs, supplementary food (roots and fish), environmental purposes such as cooling a harsh climate, groundwater recharge and cultural needs such as use for festivals. Thus restoring these reservoirs will have significant cultural benefits that can promote social cohesion.

*Enhanced food security and nutrition:* Resilience building activities will unlock improved natural resources management and be accompanied by capacity development and technical packages for sustainable and climate-resilient agricultural practices. The project will focus on increasing and diversifying production into nutritious foods, including neglected crops such as millet, which are also more climate resilient. Project activities to reduce PHL and increase processing will result in more nutritious food available for households, for longer periods, thus reducing the lean season and increasing nutritional indicators, such as dietary diversity, which will be monitored.

*Increased availability and quality of water:* Enhanced water harvesting through restoration of micro irrigation reservoirs and deploying climate-smart irrigation techniques such as household drip irrigation, will result in greater water availability and reduced conflict related to its use for household, agricultural and animal use. Increased availability of water for domestic use will assist with climate-related health problems, such as those accruing through the increasing heat stress experienced by smallholder farmers.

#### Environmental benefits

*Enhanced biodiversity and hydrological functioning of ecosystem services through restoration of micro irrigation reservoirs and agro-ecological approach of project activities:* Sustainable agro-ecological technologies supported by the project, such as agroforestry and IPM, will increase soil fertility and soil structure, as well as prevent biodiversity loss through injudicious application of chemicals. Upland contour structures and protection of stream banks will enhance the flooding protection services provided by the natural environment. Reforestation above reservoirs will be conducted using only locally appropriate indigenous species, and with biodiversity enhancement as a central goal. In addition, once restored, the village reservoirs can act as percolation tanks, recharging aquifers and retarding runoff in areas where water is both precious and scarce. This is significant given that tanks are not isolated entities but are often found in clusters forming a hydrologically integrated system or 'cascade'.

*Reduced pressure on the natural environment:* Activities under Component 2 contribute to 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 will serve to reduce the pressure on ecosystem goods and services derived from woodlands and rivers that are used by rural farmers 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 drying effects that result from increased temperature and droughts, more heatwaves, 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, both for activity design and during implementation; and technical support from experts in the field, especially in relation to sensitive or specialized services, including gender and protection issues as well as SLM and environmental management, will be sought and integrated into further design and implementation. When potential sites are identified for watershed management and larger-scale soil and water conservation works, this will be with the involvement of the local authorities, and these sites will need to be approved through the regional and district authorities' approval processes. The Environmental and Social Management Plan (ESMP) in the full proposal will provide more detail on how negative impacts will be monitored, as well as avoided or mitigated, during implementation.

#### **D. Cost effectiveness**

Cost effectiveness will be promoted through the regional approach, in which expertise, resources and innovations at different levels in the two countries will be shared. The significant shared learning-by-doing between the two countries will promote efficiencies and help to avoid duplication between similar projects in the two countries.

A key element of the cost-effectiveness of the regional approach will be to deepen the bilateral partnership on last mile climate services, so that expertise and best practices available within each country can be leveraged and shared on generating reliable climate information, translating this into user-specific advisories, and disseminating this to last mile users. Specific differentiated expertise includes IMD's capacity on generating reliable forecast products, and the Sri Lanka DoM's capacity on monsoon forum and reaching the forecast product to user sector. IMD has a High Performance Computer, WMO's Regional Training Center, and great expertise at generating climate information at various time scales. Sri Lanka's DoM has demonstrated skill at reaching out the climate information to user sectors, and in dialoguing with them to understand the demand-side and in promoting climate-informed decision making. An example of this is the Monsoon Forum, which is organized regularly even during pandemic times. Sharing these and other respective skills and expertise will enable the meteorological agencies and other stakeholders in the countries to not reinvent the wheel, but to rather piggyback on the skills sets and experience of their peers across the water. Tools that will be developed to facilitate the co-production process of agromet advisories in one country could be customized for another country with minimum efforts. Moreover, the learnings from this initiative will be shared with other South Asian countries through available platforms such as South Asia Climate Outlook Forum/ Climate User Forum, and the South Asia Hydromet Forum, to deepen the existing engagement between countries.

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.<sup>147</sup> Farmers who adapted their agricultural practices based on weather advisories in India increased their annual income by 25 to 53 percent. If the benefits to farmers from the existing top-down approach improves farmers income by 53 percent, then the bottom-up approach planned through this project can be expected to benefit them far more, as the climate services will be more closely tailored to their needs and circumstances.<sup>148</sup>

Regarding the concrete adaptation activities and livelihoods diversification that will be enabled under Component 2, there are a number of ways in which the project will promote cost effectiveness. The economic and cost effectiveness rationale for land/catchment restoration has been demonstrated both globally and in the region. Globally, it has been shown that every USD invested into restoring degraded lands yields social returns, including both provisioning and non-provisioning ecosystem services, in the range of 3–6 USD over a 30-year period.<sup>149</sup> A similar range of returns from land restoration activities has been found in India.<sup>150</sup> Thus it can be expected that catchment restoration carried out above the village water tanks will result in similar efficiencies and returns. A number of studies have provided evidence for the cost effectiveness of early response to drought, combined with safety net transfers 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

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<sup>147</sup> 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.

<sup>148</sup> Ibid.

<sup>149</sup> Nkonya, E. et al., 2016a: Global cost of land degradation. In: *Economics of Land Degradation and Improvement – A Global Assessment for Sustainable Development* [Nkonya, E., A. Mirzabaev, and J. von Braun (eds.)]. Springer International Publishing, Cham, Switzerland, pp. 117–165.

<sup>150</sup> Mythili, G., and J. Goedecke, 2016: Economics of Land Degradation in India. In: *Economics of Land Degradation and Improvement – A Global Assessment for Sustainable Development* [Nkonya, E., A. Mirzabaev, and J. von Braun (eds.)]. Springer International Publishing, Cham, Switzerland, pp. 431–469.

on the country.<sup>151</sup> 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.

There is good evidence that rehabilitation of village water schemes is more cost effective than construction of new irrigation schemes in the same localities. The Planning Department of the Sri Lanka Department of Irrigation estimated in 2012 that costs (capital) of extending major irrigation were around USD2,200 per acre of cultivable land, while the cost of rehabilitating old village schemes was USD877 per hectare.<sup>152</sup> These figures will be updated during development of the full proposal.

## **E. Consistency with national or sub-national sustainable development strategies**

The proposed project aligns with key government policies and strategies of both Sri Lanka and India in the area of agriculture (including fisheries), rural development and climate change adaptation, and gender equality. Achieving the project goal will directly contribute to achieving the targets of both Sri Lanka and India on Sustainable Development Goal (SDG) 13. The resulting improvements of community resilience, agricultural productivity and livelihoods will contribute to national SDG 2 targets, and are aligned with the Covid-19 stimulus / recovery aims of both countries<sup>153</sup>, as stated for example in the UN Response Paper developed with the GoSL that highlights the importance of building resilience not only to the immediate effects of the pandemic but on a longer-term basis that includes building necessary institutional capacities.<sup>154</sup> In India, the response to support rural community resilience has been largely through increasing employment opportunities through the MNREGA programme<sup>155</sup>; this project is consistent with this and will further develop more sustainable pathways for rural livelihood diversification.

India: The proposed project is consistent with India's National Action Plan on Climate Change (NAPCC) comprising eight national missions (Solar Energy, Enhanced Energy Efficiency, Sustainable Habitat, Water, Green India, Sustainable Agriculture and Strategic Knowledge for Climate Change), which was launched in 2008. It also aligns with the National Water Mission and the National Livelihood Mission. The project is consistent with Second National Communication (SNC) to the UNFCCC, submitted in 2012, as well as with the 2015 first Biennial Update Report (BUR) to the UNFCCC. India's Nationally Determined Contribution (NDC) to address climate change prioritises additional forest and tree cover; and India has embarked on a global program to promote investment in solar energy by sponsoring the International Solar Alliance and is developing a global program on resilient infrastructure. India has given its strong commitment to meeting the SDGs. Its key major developmental programmes, the strategies for a 'New India' by 2022, and the country's vision for 2030 are aligned with the spirit of SDGs 2 and 13, amongst others.<sup>156</sup> The emphasis on longer-term adaptation to heat stress is in line with the 2018 Heat Action Plan for Odisha.<sup>157</sup> The project will promote the achievement of relevant gender targets from SDG5 that form part of the SDG India index, including promoting equitable female/male labour force participation rates, as well as equal pay, in the project activities. The project is aligned with the National Youth policy of 2014 in terms of facilitating opportunities for youth skills development and entrepreneurship.

Sri Lanka: The project is aligned with Sri Lanka's national priorities for the three Rio Conventions, as set out in the National Biodiversity Strategic Action Plan 2016-2022 (CBD), the National Adaptation Plan for Climate Change Impacts in Sri Lanka 2016-2025 (UNFCCC) and the National Action Programme for Combating Land Degradation in Sri Lanka 2015-2024 (UNCCD). It is consistent with Sri Lanka's Climate Change Policy (2012), the National Climate Change Adaptation Strategy for Sri Lanka 2011-2016, and the National Disaster Management Policy of Sri Lanka. Climate advisory services are strongly recommended in Sri Lanka's National Adaptation Plan, providing opportunities for future scale up and access to climate financing. Project actions are supportive of the Land Degradation Neutrality by 2030 (LDN) targets, particularly restoring and improving degraded forest (80% in the dry zone and 20% in the wet zone), reducing the rate of soil degradation to improve land productivity and Soil Organic Carbon (SOC) stocks, and reducing soil erosion of lands cultivated with annual and plantation crops. Moreover, the project will contribute to the implementation of government priorities as articulated in its Vision 2025, in the Public Investment Programme (2017–2020), in sector-specific strategies and plans of action, and in the United Nations Sustainable Development Framework for 2018–2022 for achieving Sustainable Development

<sup>151</sup> 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](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/67330/Econ-Ear-Rec-Res-Full-Report_20.pdf)

<sup>152</sup> As quoted in the Mahaweli proposal submitted to the AF in 2013.

<sup>153</sup> Note that neither country has put forward an overarching Covid-19 response policy document or programme, but has set out a range of intentions and targets for recovery from Covid-19 in various releases from different ministries.

<sup>154</sup> UN Advisory Paper: immediate socio-economic response to Covid-19 in Sri Lanka. June 2020.

<sup>155</sup> <https://www.brookings.edu/blog/future-development/2020/07/13/the-impact-of-covid-19-and-the-policy-response-in-india/> accessed 14/07/21.

<sup>156</sup> NITI Aayog (2019) 'Localising SDGs: early lessons from India 2019'. Specific examples are the flagship programmes of the government of India such as Poshan Abhiyaan (National Nutrition Mission), Aayushman Bharat (National Health Protection scheme), Beti Bachao Beti Padhao (Care for the girl Child) and Aspirational Districts programme, just to name a few, which directly address the challenges highlighted by SDGs.

<sup>157</sup> <http://www.indiaenvironmentportal.org.in/files/file/Heat%20Action%20Plan%20for%20Odisha,%202018.pdf> accessed 16 June 2021.

Goal 2. The proposed project advances the objectives of the Draft National Policy of Women by ensuring that gender considerations are effectively integrated in the design through meaningful consultations and gender analysis; and through equal participation and benefit from programme outcomes and supporting women and girls to increase their decision-making power. The project is consistent with the aims of building up youth agricultural entrepreneurs as stated in Sri Lanka's Shared National Policy Framework of 2019.<sup>158</sup>

## **F. Compliance with national technical standards**

Implementation of this project will be governed by a range of national laws, policies, regulations and guidelines in Sri Lanka and India, including the overarching prescriptions emanating from the Constitutions, and the sustainable development and environmental management legislative and policy frameworks.

Environmental and sustainable development provisions emanate from the Constitution of India, which includes a directive to the State for protection and improvement of environment, and includes a fundamental duty on each citizen in Article 51-A (g) which states: "It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures." Sri Lanka's Constitution imposes a similar fundamental duty of care on the State and all citizens and translates these provisions further in the National Environmental Policy (2003). The project will comply with all provisions of the environmental management framework legislation in both countries, as well as with the Environmental and Social Policy of the Adaptation Fund and the Environmental and Social Safeguards of WFP. In India, environmental legislation cascades down from the national Environment Protection Act of 1986, while in Sri Lanka the primary law is the National Environmental (Amendment) Act of 1988.

The project will comply with the relevant national technical standards for all of the adaptation activities under Component 2, not least those that involve catchment restoration and soil and water conservation activities, which may comprise silt traps, stone terracing, grass seeding, small dam rehabilitation or restoration of micro irrigation reservoirs. In India, such activities fall under various State departments, such as the Odisha State Department of Agriculture and Farmers' Empowerment, the Department of Forest and Environment, and the Department of Water Resources, as well as any localised standards prescribed at the district level. In Sri Lanka, activities for conservation and development of water resources fall under the provisions of a range of departments and bodies as set out in the National Policy on Water Resources Development, Conservation and Management<sup>159</sup>, including Irrigation Department, Mahaweli Authority of Sri Lanka, Central Environmental Authority, and Provincial Councils/ Provincial Irrigation Department/ Municipal Councils/ Urban Councils. Forestry-related activities, such as small-scale planting of trees to protect micro-catchments above village irrigation systems fall under any prescribed standards of the Forest Departments of Odisha and Tamil Nadu in India, and in Sri Lanka, those falling under the Department of Forestry and the Department of Agrarian Development.

Regarding agricultural activities, such as demonstration of climate-resilient and short-cycle crops, good agricultural practices (GAPS), drip/micro irrigation, vegetable/kitchen gardens etc., in India these fall under standards recommended by the Indian Council of Agriculture Research (ICAR), as well as packages of good practices of the respective States. The Bureau of Indian Standards (BIS) has developed a number of relevant standards, including Farm Irrigation and Drainage Systems, Good Agricultural Practices and Post-harvest Management Systems.<sup>160</sup> In Sri Lanka, technical prescriptions for agriculture fall under the Ministry of Agriculture, and include guidance and technical standards on green agriculture and Good Agricultural Practices.<sup>161</sup> The Sri Lanka Standards Institute (SLSI) has promulgated a number of relevant standards, including those governing agricultural irrigation equipment, and requirements for GAPS for different crops. Any processing of agricultural products will comply with the relevant food safety standards in each country. Regarding fish cultivation in farm ponds, the BIS has recently developed standards on fish, fisheries and aquaculture. The project will discuss with the SLSI whether there are any relevant standards for fish cultivation in small farm ponds. For provision of climate services, should the project provide any meteorological equipment, this will meet the standards prescribed by the BIS and the SLSI.

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.K, and as will be set out in the project environmental and social

<sup>158</sup> GoSL (2019) National Policy Framework: Vistas of Prosperity and Splendour.

<sup>159</sup> [http://www.agrimin.gov.lk/web/images/pdf/15.08.2019\\_Draft%20Water%20Policy%20Full\\_English.pdf](http://www.agrimin.gov.lk/web/images/pdf/15.08.2019_Draft%20Water%20Policy%20Full_English.pdf)

<sup>160</sup> [https://www.services.bis.gov.in:8071/php/BIS\\_2.0/dgdashboard/published/new\\_subcommtt?depid=NjE%3D](https://www.services.bis.gov.in:8071/php/BIS_2.0/dgdashboard/published/new_subcommtt?depid=NjE%3D)

<sup>161</sup> See <https://doa.gov.lk/index.php/en/>

management plan (ESMP) to be developed for the full proposal. Relevant national and international technical standards governing any cash-for-work activities that will be complied with include the following:

- Labour laws and standards in both countries, including those governing equal compensation for women and men
- WFP – Harmonized Approach to Cash Transfer (HACT) Framework
- WFP – Cash Based Transfer (CBT) Manual
- WFP - Food Assistance for Assets Manual
- WFP – Cash Based Transfer (CBT) Financial Management
- IFRC - Cash Based Transfer Guidelines<sup>162</sup>
- International Organization for Standardisation – Cash for Work

## **G. Avoiding duplication with other funding sources**

There are several climate change-related projects and programmes operating or planned at the regional level and in the project localities. In order to find synergies and avoid duplication, the project team has actively sought out available information and held discussions with stakeholders. The AF project will build on/complement the projects set out in the table below, as indicated in the right-hand column.

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<sup>162</sup> <https://www.ifrc.org/Global/Publications/disasters/finance/cash-guidelines-en.pdf>

Project Title	Funding / institutions	Timeframe & regions	Specific locations	Key strategies	Complementarity with proposed WFP AF India/Sri Lanka regional project
<b>REGIONAL</b>					
Investing in CC Adaptation through Agroecological Landscape Restoration	ADB / Japan Fund for Poverty Reduction	Approved July 2020, runs for 3 years	Bangladesh, Cambodia, Myanmar, and the Philippines	USD2m for TA. Will promote agroecological landscape restoration and climate-resilient agricultural livelihoods in climate-vulnerable communities.	No geographical overlap. The ADB project will carry out analytical studies to inform adaptation policies and the preparation of investments in CC adaptation through the agroecological restoration. The project team will liaise during FP development to integrate relevant lessons learned into the AF project.
AVACLIM : Agroecology, Ensuring Food Security and SL while Mitigating CC and Restoring Dryland Regions	GEF / FAO	Approved Sept 2019. 3 years. India, Brazil, Burkina Faso, Senegal, Ethiopia, South Africa, Morocco		AVACLIM will provide reliable information on and advocate for the integration of the agroecology approach into development planning across drylands.	The AF project will interact during detailed planning to identify possible synergies and ways to integrate the knowledge on agroecological approach generated by AVACLIM into implementation.
Asia Regional Resilience to a Changing Climate (ARRCC)	DfID/ World Bank/ RIMES <sup>163</sup> / SASCOF <sup>164</sup> / UK Met Office; WFP/others support delivery	2018-2022 Regional platforms; national activities in Bangladesh, Pakistan, Nepal & Afghanistan.		Will deliver new technologies and innovative approaches to help vulnerable communities use weather warnings/forecasts to prepare for climate-related shocks, through improved access to CIS and EWS. Includes impact-based forecasting. <sup>165</sup> Will set up 3 regional bodies for seasonal and long-term climate projections/analysis, & will work with NMHSs to design products for priority sectors.	No geographical overlap for national activities. <i>Potential</i> lessons from the work in Nepal on better use of seasonal forecasting in the agricultural sector. Potential regional synergies will be harnessed through interactions on the South Asia Hydromet Forum newly established South Asian Regional Forum on Climate Science and Services.
Program for Asia Resilience to Climate Change (PARCC)	UK funded / World Bank administered	2018-ongoing Afghanistan, Bangladesh, Bhutan, India, Maldives, Myanmar, Nepal, Pakistan, and Sri Lanka		Strengthen disaster and climate resilience. Key areas include (i) South Asia Hydromet Forum (SAHF) <sup>166</sup> ; (ii) TechEmerge Resilience India Challenge - solutions using emerging/disruptive technologies; (iii) South Asia Climate Adaptation and Resilience Partnership (SACARP); (iv) Managing Fiscal Risks Associated with Climate Change	The AF regional project will pursue opportunities for regional coordination and leveraging of activities with the SAHF and SACARP, during development of the full proposal.
Climate Adaptation and Resilience for South Asia	World Bank / RIMES / Asian Disaster Preparedness	Approved May 2020. 5 yrs.(USD39.5m) Regional		Will develop public domain platform: Regional Resilience Data & Analytics Service, with information on weather hazards, climate variability & sector-specific data for	The AF regional project will address key common adaptation challenges in implementing the Paris Agreement in the region, as identified by CAP-South Asia. Regional forums established under CARE will

<sup>163</sup> Regional Integrated Multi-Hazard Early Warning Systems

<sup>164</sup> South Asian Seasonal Climate Outlook Forum

<sup>165</sup> CARISSA work package deals with longer-term climate projections; SCIPSA work package deals with development and downstream use of seasonal climate information - including the SCOS, or seasonal climate outlook statement, co-produced with communities.

<sup>166</sup> The report from this forum is useful for summarizing priorities for regional collaboration.

(CARE)	Center (ADPC) Funded under PARCC.	platform. Detailed activities in Bangladesh, Nepal, and Pakistan.		policymakers. Will <u>develop guidelines for mainstreaming CC</u> in finance, agric, water, transport. ADPC established Climate Adaptation Platform South Asia (CAP-South Asia) for regional MSH dialogue; first regional policy dialogue held 9 December 2020.	be used to promote vertical and horizontal learning, particularly around the innovative co-production of tailored agro-hydromet advisories for different groups on the ground, and their dissemination and scaling up.
Sustainable Management of the Bay of Bengal Large Marine Ecosystem Programme	GEF / FAO / various EEs	Concept (2018). Bangladesh, Indonesia, India, Sri Lanka, Myanmar, Maldives, Malaysia, Thailand		Focal areas: International waters; climate change. Main emphasis on marine conservation and fisheries management. Includes livelihoods diversification for selected coastal communities, including through climate-resilient agriculture and aquaculture. Also increasing access to innovative financial services and insurance.	During detailed project development, the AF project team will discuss with the FAO the possibility of any synergies related to the proposed climate-resilient agriculture, aquaculture and financial services activities.
<b>SRI LANKA</b>					
Strengthening the resilience of smallholder farmers in the Dry Zone to climate variability and extreme events through an integrated approach to water management	GCF (\$38m grant) / UNDP / Ministry of Mahaweli Development and Environment	Under implementation, 2016-2024	Northern & Eastern Regions	The GCF project is improving community irrigation water infrastructure, scaling-up decentralized drinking water systems and climate-smart agricultural practices in three river basins, and strengthening early weather warnings, flood-response, and water management. It will co-develop and disseminate weather- and climate-based advisories for agricultural and water management through ASCs and FOs to farmers and village water managers.	The GCF project focuses specifically on drinking water systems, which is not a focus of the AF project. Duplication regarding village irrigation systems will be avoided through working in different localities. Based on discussions to be held during full proposal development, the AF project will build on and further develop the GCF's work in co-developing agro-met advisories (budget of USD2 million), and harness efficiencies, e.g. using similar service providers if possible.
Strengthening the Resilience of Post Conflict Recovery and Development to Climate Change Risks in Sri Lanka	GEF SCCF / UNDP / Ministry of Economic Development, Ministry of Environment	2013 - 2018		Aim is to increase resilience through integration of climate smart policies and actions into rural development planning and budgeting	AF project will build on mainstreaming of climate change into district, divisional and village development plans developed during this GEF project, and will use the climate-resilient village economic development plans as an input into community adaptation plans, should there be any overlap of districts.
Addressing Climate Change Impacts on Marginalized Agricultural Communities Living in the Mahaweli River Basin of Sri Lanka	AF / WFP / Ministry of Environment/ Ministry of Agrarian Services and Wildlife	Approved 2013 MTE 2018		Addresses specific vulnerabilities faced by rain-dependent farmers; strategies to overcome dry season food and income security; introduction of diversified income sources to broad-base risk, improved water storage and irrigation to overcome uncertainty of rainfall, improved soil quality and fertility for increased production, and timely, quality agriculture advice and extension.	The AF project under development will build on lessons learned and address issues identified in the evaluation of the AF Mahaweli project. Specifically, WFP is implementing a strategy to strengthen the M&E systems for the projects that it supervises. This includes having a stronger focus on M&E in the full proposal development stage, with sufficient specific budget earmarked for M&E activities, including staffing. WFP will build this approach with a higher number of field associate positions for field level monitoring in future projects. A robust Complaints and Feedback Mechanism is currently being rolled out

					across all WFP interventions. WFP has trained field officers on corporate M&E standards; and is conducting diligent follow up and regular monitoring on all on-going projects to meet those standards.
Sri Lanka: Smallholder Agribusiness and Resilience Programme (SARP)	IFAD	Not yet entered into force.	Project area: Mannar, Vavuniya, Anuradhapura, Puttalam, Kurunegala, Matale	Build resilience and market participation of rural households in geographical areas affected by climate change	WFP will intervene in Anuradhapura, Mannar, Matale for: Climate Risk Analysis consultancy; b) preparation of E&S Mapping Framework; c) VAM targeting & planning. SARP will also partner with WFP, "Building Resilience Against Recurrent Natural Shocks through Diversification of Livelihoods for Vulnerable Communities in Sri Lanka" project through entrepreneurship capacity building, strengthening services of Agrarian Service Centres & Agrarian Banks and linking entrepreneurial FOs to private sector buyers.
<b>INDIA</b>					
Andhra Pradesh Drought Mitigation Project (APDMP)	IFAD	2017-2022 Andhra Pradesh	Located in 5 driest districts: Anantapur, Chittoor, Kadapa, Kurnool and Prakasam	Includes providing farmers with information on weather, markets and cropping options, along with promotion of climate-resilient agricultural practices. 105 climate information centres (CLiCs) established. As of 30 August 2020, 12,155 farmers have used the CLiC centres, for weather related information. MOU between APDMP and ANGRAU entered in August 2019, and activities to enhance capacities of CLiC are planned.	No geographical overlap. The AF project will integrate lessons learned from the CLiCs into detailed project planning and implementation, as well as those from the APDMP's work with farmer producer organisations (FPOs). <sup>167</sup> APDMP's tie up with markets and finance institutions was yet to be developed at time of CN development, any relevant synergies will be harnessed during implementation of the AF project.
Odisha PVTG Empowerment and Livelihoods Improvement Programme	IFAD	2016 – 2024 Odisha	17 Micro Project Agency (MPA) in 12 districts <sup>168</sup>	The goal of the project is to achieve enhanced living conditions and reduced poverty of target households. Key interventions include: (i) Community empowerment; (Incl. rural finance services); (ii) Natural Resource Management and Livelihoods enhancement; (NRM, Food and nutrition security) and (iii) Community infrastructure & drudgery reduction	The AF project will not work in the same localities as the IFAD project, but will learn from and build on the institutional development in its work with PVTGs. Potential synergies with respect to NRM and livelihoods enhancement will be harnessed through discussions with relevant govt. agencies and service providers during project detailed planning and implementation.

<sup>167</sup> As of August 2020, 105 FPOs with 72,022 members are operational. 103 FPOs have received seed license to sell improved seed varieties and 28 FPOs have received fertiliser license. FPOs also run custom hiring centres and rent out mobile irrigation equipment.

<sup>168</sup> Malkanagiri, Rayagada, Angul, Deogarh, Ganjam, Nuapada, Keojhar, Sundergarh, Gajapati, Kandhamal, Kalahandi and Mayurbhanj

Green-Ag: Transforming Indian Agriculture for Global Environmental Benefits & Conservation of Critical Biodiversity & Forest	GEF / FAO	2018-2025 National plus platforms in Madhya Pradesh, Mizoram, Odisha, Rajasthan, and Uttarakhand.		Will strengthen national and state level institutions and agricultural programmes (missions), including mainstreaming of CC. Project community-level outcomes and SLM (including organic farming and agrobiodiversity conservation) will be measured through Green Landscape monitoring programme. A target Green Landscape of 175,000ha is planned for Odisha.	The AF team will determine whether there is any overlap with the Green Landscape proposed for Odisha under the GEF project during detailed project planning, and will harmonise its agri-ecological approach under Component 2 with the GEF project's approach to SLM, organic farming and agrobiodiversity during implementation.
Sustainable and resilient livelihood options for rain-fed areas of India (NRAA)	FAO	2019-2021 Maharashtra, Rajasthan and Odisha	Specific districts in Odisha TBD.	Increased farmer incomes and improved resilience through sustainable livelihood models developed for rural rain-fed areas	The AF project will have further discussions with FAO during full project development to determine specific synergies and to avoid geographical overlap.
Transforming Rice-Wheat Food Systems in India (PPG)	GEF-FAO	2021-2027 Punjab, Haryana, Odisha and Chhattisgarh	Specific districts in Odisha TBD.	The project will greatly accelerate India's efforts to evolve a new model of sustainable agriculture that goes beyond current resource intensive rice-wheat cropping systems, to transition towards ecologically functioning and healthy landscapes and ecosystems.	The AF project will harmonise its agri-ecological approach and promotion of integrated farming systems under Component 2 with the GEF project's emphasis on ecologically functioning ecosystems during implementation.
Climate Proofing of Watershed Development Projects in the States of Tamil Nadu and Rajasthan	AF / National Bank for Agriculture and Rural Development (NABARD) (IE) /	Approved 2015 Tamil Nadu and Rajasthan		Soil and water conservation; Increased adaptation to climate change through climate resilient farming system approach and diversification of livelihoods; Integration of risk mitigation products like crop, weather and market advisory for the farmers; Creation of knowledge management system for climate proofing of watershed project and livelihoods	While there is no geographical overlap, the AF project will build on lessons learned from this earlier AF project. It will particularly determine whether it is possible to build on and further develop the knowledge management system for climate proofing of watershed project and livelihoods.
Climate Proofing of Watershed Development Projects in the States of Tamil Nadu and Rajasthan	AF / National Bank for Agriculture and Rural Development (NABARD) (IE) /	Approved 2015 Tamil Nadu and Rajasthan		Soil and water conservation; Increased adaptation to climate change through climate resilient farming system approach and diversification of livelihoods; Integration of risk mitigation products like crop, weather and market advisory for the farmers; Creation of knowledge management system for climate proofing of watershed project and livelihoods	While there is no geographical overlap, the AF project will build on lessons learned from this earlier AF project. It will particularly determine whether it is possible to build on and further develop the knowledge management system for climate proofing of watershed project and livelihoods.

## H. Learning and knowledge management

Developing targeted knowledge and using this to enable and scale up an evidence-based approach to implementation of community-based adaptation is a central element of the project's strategy. To promote systematic learning and dissemination of this, the project will develop a learning and knowledge management (L&KM) strategy under Component 1, which will set out how feedback loops for iterative horizontal and vertical learning will be established to promote efficient and effective project operations, as well as how the innovative approaches and activities of the project will be documented and shared externally. The learning and knowledge management system for the project will promote the gathering, sharing, and utilising of knowledge related to the project's activities across departments and project components, and between countries, as well as regionally. While important for the project's internal functioning and sustainability, this will also help to address the common problem of compartmentalisation of government departments and what may sometimes be a culture of reluctance to share information and resources. The L&KM strategy will include appropriate knowledge products to be developed where necessary – for example, policy briefs that describe the process of developing participatory LMCS.

The project will integrate lessons from the LMCS pilot project in Sri Lanka and other successful piloting of climate services initiatives in India, as well as lessons from the planning and implementation of adaptation solutions in dryland areas in the region. An innovative aspect of the project will be to develop a model for institutionalisation and scale up of gender-sensitive LMCS, considering the learning from the implementation. Far from detracting from the implementation of concrete adaptation activities, this more systemic element is of critical importance for the sustainability of the project. Thus, it will be necessary to carefully document and disseminate valuable lessons learned, as well as systematic approaches developed.

The regional approach of the project is key to cost effective learning and knowledge transfer and scalability. The project will leverage existing regional forums and, if necessary, develop dedicated knowledge and information sharing mechanisms to allow exchange of experiences, best practices and lessons learned on adaptive sustainable practices and delivery of last mile climate advisory services across both countries and among communities. The two countries will share expertise and technical support to develop common strategies and allow collective learnings to address cross-boundary climate change challenges experienced in the dryland areas, which have been so far addressed separately, such as improved water management through rehabilitation and de-siltation of village water reservoirs and irrigation channels, enabled through ecosystem restoration. The project will assist both countries to learn from each other, sharing strengths and knowledge, and optimising resources to generate solutions for poor rural communities. By developing internal project mechanisms for cross-border sharing of institutional and community-level knowledge and experiences, and by nesting these mechanisms in the existing regional forums for external learning, the project will set the ground for scale-up at national and possibly more broadly across the South Asian region. The national and regional feedback loops will be windows from which the impact of adaptation solutions informed by targeted climate services can be assessed, adding to wider learning within and between participating institutions, as well as more broadly.

Further details of the project's approach to learning and knowledge management will be elaborated during full proposal development, after further consultations with key stakeholders and community members in the targeted localities.

## I. Consultative process

National- and state/provincial-level stakeholder consultations were carried out in both countries with a range of institutions from government, academia/research, private and NGO sectors.

In India, consultations at the national and state level were carried out primarily in late January and early February 2021, with additional meetings taking place in April and May. The project team met with different national ministries of the GoI, including Ministry of Environment, Forest and Climate Change (MoEFCC), Ministry of Agriculture and Farmers Welfare (MoA&FW), Indian Meteorological Department (IMD) in the Ministry of Earth Sciences (MoES), and the National Rainfed Area Authority (NRAA). In Tamil Nadu, the team met with the Department of Environment (DoE), Fisheries Department, Food and Agriculture Organisation (FAO), and the Centre for Climate Change and Disaster Management (CCCDM) in Anna University. In Odisha State, the team met with Department of Agriculture and Farmers' Empowerment, Fisheries and Animal Resources Development Department, Department of Co-operation, Odisha State Disaster Management Authority, National Bank for Agriculture and Rural Development (NABARD), Regional Centre for Development Cooperation (RCDC), Oxfam, Odisha University of Agriculture and Technology, and CTRAN (NGO/think-tank).

In Sri Lanka, after an initial meeting at the Climate Change Secretariat (CCS) in February 2021, consultations at the national and provincial level were carried out in April and May 2021. At the national level, the team met with the Ministry of Health (MoH), Ministry of Foreign Affairs (MFA), National Planning Department and Department of External Resources within the Treasury, Ministry of Agriculture (MoA), Ministry of Forest Conservation (MFC), and the National Aquatic Resources Development Authority (NAQDA). Meetings were also held with the Department of Meteorology, DoA, and Department of Agrarian Development (DAD).

Key issues that arose during the stakeholder consultations were (i) Agreement on climate change impacts affecting the project areas in SL and India, including increased temperature, delayed monsoon and erratic rainfall, with more intense rainfall events, increased frequency of cyclones, floods, heatwaves and droughts leading to food and water security concerns, and increased soil and water salinity as direct climate risks, as well as poor human health and impacts on ecosystems; (ii) Consensus across the project areas on critical environmental and other challenges facing the agriculture sector, including an increase in the proportion of fragmented and marginal holding of land, poor management of water use, lack of rural and market infrastructure, price instability and rising cost of farm inputs, high rates of ground water exploitation, and rapidly declining natural resources; (iii) the need for knowledge, strategies and approaches that enable vulnerable communities to cope with climate change and adapt to the impending impacts, combined with climate literacy and advocacy; (iv) insufficient attention paid to current and future impacts of heatwaves – more awareness and adaptation needed on heat stress; (v) strong agreement across institutions and countries on proposed focus on tailored last mile climate services, with more attention to advisories for variability and slow onset climate conditions; (vi) training of ground-level agriculture officials and other service providers on co-developing national agromet advisory to the local level is needed; (vii) need to identify specific information dissemination channels so that marginalized and vulnerable farmers have appropriate and useable access to targeted information - how can ICT be used to enable and scale up CS for the vulnerable?; (viii) important to adopt an ecosystem-based adaptation (EbA) approach, which should be systemic as well – for example, NRM/watershed management; (ix) water stress / management is a critical issue, including reduced use of irrigation through tanks and canals (due to erosion/siltation) and thus more pressure on groundwater, as well as need to protect the health of farming communities against heat stress; (x) support for promotion of integrated farming system with range of components: crop production, farm pond, kitchen garden, pisciculture, poultry, apiculture, vermicompost, duckery, etc., but needs to take into account vulnerability to drought exposure in inland water fisheries; (xi) range of agricultural adaptation technologies proposed e.g. climate-smart irrigation, drought- & flood-resistant varieties, GAPS, traditional methods of pest control; (xii) farmgate level processing and marketing necessary, as is livelihoods diversification, especially for women, and increasing access to timely and adequate credit to farmers; (xiii) adaptation technologies to address deterioration of air quality, forest depletion and human-wild animal conflict; (xiv) consider when planning adaptation options: rural-urban migration and psychosocial concerns (farmer suicides); (xv) support for clearly stated sustainability / eco-agriculture approach to promote and maintain ecosystems, rejuvenate forests, integrated farming systems, ensure biodiversity, increase farmers' awareness of link between forests, climate, agriculture and food security.

National validation processes were carried out in both countries. In Sri Lanka a stakeholder meeting was held on 16 July 2021, which was chaired by the CCS and attended by 15 national-level stakeholders from seven departments of the GoSL. Minor comments were received and integrated into the CN. In India, the draft CN was shared with all key stakeholders for their feedback and concurrence. Led by the MoEFCC, the feedback was sought from the Ministry of Rural Development, MoES (IMD), MoA&FW, State Governments of Odisha and Tamil Nadu. All partners appreciated the necessity of the initiative; their feedback has been incorporated.

Community consultations were carried out in the targeted dryland areas in both India and Sri Lanka to understand the climate vulnerability and adaptation needs of community members. For consistency, each community received the same set of questions, centring around their livelihoods, perceptions and impacts of climate change, support from external agencies, and adaptation gaps and needs. Wherever possible, these were disaggregated for women, men, female youth, male youth, elderly people, and vulnerable groups. Some sub-national authorities and service providers were also present at these meetings.

Given the restrictions and lockdowns associated with the coronavirus pandemic, and the need to prioritise the health and safety of staff and community members, field trips out to the localities in the eastern states of India and the dry zone of Sri Lanka had to be limited during the early stages of development of the CN.<sup>169</sup> Thus, in order to ensure as comprehensive an understanding of community-level vulnerabilities, impacts and adaptation priorities as possible, the primary data was supplemented with secondary community-level material, such as climate

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<sup>169</sup> The in-person community consultations were somewhat limited in terms of number of consultations, size, time and ability to have separate meetings with women, men, female youth, male youth, and vulnerable groups.

vulnerability and impact assessments, adaptation needs assessments, and existing project proposals that directly gathered community-level information. In India, three in-person community consultations were carried out in the eastern states of Odisha and Tamil Nadu, involving a total of 116 participants (60 women and 56 men). In Sri Lanka, it was possible to hold one in-person community consultation with a total of 34 participants (17 women and 17 men) in April 2021, before the Government of Sri Lanka (GoSL) instituted further restrictions in the light of the increasing coronavirus pandemic wave in South Asia. This information was supplemented by a village context analysis conducted in dry zone localities for the Last Mile Climate Services (LMCS) pilot project.

Community consultations noted that the high variability of rainfall, flash floods during the rainy season, heatwaves in summer, and intense coastal flooding and cyclones leave people with long periods of food shortage (Odisha). The multi-pronged nature of the situation was expressed well by participants from the Matale district, dry zone division of Wilgamuwa in SL, who stated that despite increased drought, they also experienced intense rainfall that contributed to flash flooding and soil erosion, affecting productivity; but that the quantity of rainfall received has diminished over time, while temperature increases are clearly felt. Community members stated that they also experience the consequences of climate change on human health, through increased cases of asthma, respiratory allergies and airway diseases, cardiovascular disease and stroke, food-borne diseases and malnutrition, mental health, skin diseases for women, and water-borne diseases. Reduction in cropping area due to unfavourable climatic conditions leads to increased area under fallow, resulting in invasion of *Prosopis juliflora*; if the fallow period extends for more than a year, restoration becomes a challenging practice (TN). Vulnerable groups, especially in landless labour communities, increasingly depend on non-farm employment, which is scarce. Consultations revealed a reduction in the cropping intensity in some localities, from two crops to only one per year, which has affected the households' farm income and food security, leading to complete dependence on the rice distributed through Public Distribution System (PDS) (TN).<sup>170</sup> Participants in the Odisha consultations said that due to the shifting of rainfall patterns, the rabi season (crops sown in winter and harvested in spring) goes dry, and they cannot have a second crop.

Across the targeted dryland areas of the two countries, women and men farmers and agriculture labourers adopt diverse strategies to cope with negative impacts, including changing individual agronomic practices, e.g. to long-term crops like coconut intercropped with cowpea or groundnut; migration of men to non-farm sectors in other states/countries; increasing the number of goats and poultry to reduce the crop cultivation risks; diversifying homestead gardens with trees and vegetables for regular income by women; and seeking off-farm employment from government schemes by women, for example, India's MGNREGA. These decisions are also governed by changing socio-economic issues such as access to labour in households, etc. In Matale district, dry zone division of Wilgamuwa, in response to the lengthening of the food-insecure season, farmers sell valuables and productive assets as a coping strategy and also increase their indebtedness.

Despite the response of community members, more than 95 percent of households in a number of localities depend on the Public Distribution Systems, which only partially meet household food requirements; and on school feeding and supplementary nutrition schemes for pregnant/lactating mothers and children. They also borrow money, often from local money lenders, leading to increasing levels of indebtedness. Among vulnerable households, the educated youth leave for employment in nearby towns. In some areas, migration due to climate stress has become rampant (e.g. Puri district of Odisha). Participants have limited access to extension services, climate information, and awareness of entitlement schemes/services. Farmers can access generic climate information through mass media (TV/radio), but this is inadequate for existing livelihoods' challenges. In Odisha, mobile penetration is high, and people would like to receive relevant climate advisories. However, in Sri Lanka, a note of caution was raised, as mobile coverage is limited and there are almost no smartphones in the area. Nevertheless, there is a strong demand for targeted climate/agro-met advisories across the project localities.

Please see **Annex 1** for a list of national stakeholders contacted, and **Annex 2** for additional detail on the community consultations.

## **J. Full cost of adaptation reasoning**

### **Component 1**

#### Baseline scenario:

Currently, agricultural production and related water security in the dry zones of Sri Lanka and eastern India is hampered by a lack of targeted weather, climate and hydrological information to use for local-level agriculture and

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<sup>170</sup> This only meets partial requirements of a family (5 kg per head per month).

village water management. Farmers do not currently receive targeted and localised forecasts on which to base decisions about when and which crop varieties to plant. Similarly, water releases in the village cascade systems are not planned using localised early warnings of extreme rainfall, which would allow them to plan discharges and flood mitigation measures to limit damages to infrastructure. At the same time, men and women farmers in the project localities identified unpredictable monsoons, increasing drought and dry spells, shift in sowing period, excessive rain and flooding, and more heatwaves, as climate impacts that are already affecting them. While farmers in the project localities have expressed demand for better climate services, they currently do not have high levels of trust in them as they are too generic. In many cases farmers may not pay any attention to the climate services provided for instance on the radio or television. Thus their planting and other farming decisions are not informed by climate and weather forecasts and have high associated risks for crop loss and failure. While heat stress is increasingly experienced in the project localities, there is limited awareness of the need to also factor this into livelihoods' choices. At the community and district level, extension services providers and intermediaries currently have low levels of abilities and/or inappropriate information inputs to develop the kind of targeted and integrated climate and agricultural advisories that would assist community members to enhance and climate proof their livelihoods from season to season. Nationally, the hydro-meteorological services have expressed high levels of interest in but have limited or no experience of developing responsive LMCS, although they have considerable expertise in forecasting and related areas. Where projects have implemented climate services that are more locally targeted, these have been on an *ad hoc* basis and have not formed part of a system to institutionalise these within the government system, for greater sustainability and scaling out. The net result is a sub-optimal delivery of climate services to local communities, at a time when both gradual and acute climate impacts are accelerating and poor rural people are experiencing extraordinary added stresses on their livelihoods, due to the coronavirus pandemic.

#### Additionality:

By enabling last mile access to detailed, localised and up-to-date climate services, and making it easy to understand and readily actionable, the project will allow different groupings within the most remote and vulnerable communities to effectively plan and choose the most appropriate adaptation options for their specific context. As the LMCS will be tailored in terms of content as well as dissemination channels, they will be actionable by women and men farmers for different livelihoods systems. Climate services will be provided at different temporal scales, including seasonal, sub-seasonal, and *ad hoc*, in response to identified needs of community members. This will mean that different community members will have greater flexibility in their livelihood systems – they will not, for example, be limited to only the current predominant crop, which is usually paddy rice, but can consider which other options they might wish to plant – such as more nutritious crops like millets and legumes – depending on the actionable seasonal and sub-seasonal forecasts they will obtain. The risk of crop failure will be greatly reduced and women and men farmers will consequently be in a position to once again build up their asset bases as production increases and is more climate-resilient, and sustain their livelihoods into the future. Advocating for the Gol and the GoSL to develop an institutionalised system for LMCS, and providing technical assistance to facilitate this, will result in an ongoing basis upon which community members can continue to implement climate-informed adaptation decisions, not only in the project localities but also across different parts of the two countries. It will remove the need for subsequent projects to 'reinvent the wheel' in this regard. Lessons from developing the institutionalised systems will be shared regionally on an ongoing basis through identified mechanisms, resulting in potentially wider adaptation benefits in South Asia.

## **Component 2**

#### Baseline scenario:

A critical constraint to developing effective and sustainable adaptation measures to address the current and future climate risks and impacts in the dryland areas of eastern India and Sri Lanka is the limited extent of knowledge of the adaptation options and technologies that would be appropriate in different contexts, as well as a lack of technical support for implementation of these. The livelihoods of rural dwellers are constrained by the environmental degradation and rapid shrinkage of natural resources upon which agricultural livelihoods depend in the project localities, which acts as a further barrier to effective local-level adaptation. The health and ecological functioning of land, surface and ground water, soils and biodiversity is declining, and rapid deforestation is leading to increased soil erosion, watershed degradation and loss of valuable ecosystem services such as water purification and flood control. Village water storage bodies are often dysfunctional or have significantly reduced effectiveness due to siltation. Direct climate risks that exacerbate environmental degradation include increased soil and water salinity, and vegetation changes due to increased average heat and drought incidence. Many poor and vulnerable community members are pushed into an ongoing cycle of coping which is leading to loss of productive assets as they struggle from one season to the next with different weather and climate impacts,

exacerbated by external stressors such as macro-economic shocks, price increases and disease outbreaks, including the current coronavirus pandemic. Moreover, community members and vulnerable groups in general lack the financial resources to be able to implement appropriate adaptation measures on an ongoing basis, and also lack support and skills for value addition to increase household income from food production, as well as livelihood diversification away from agriculture. In the absence of knowledge of specific adaptation options that are tailored to local conditions and livelihoods as well as to the changing weather and climate, rural people continue to experience impacts such as poor human health, increased crop loss and indebtedness, increased cost of the food basket over the last decade, and an acceleration in rural-urban migration that further forecloses livelihood options. Deteriorating environmental quality and increasing rural-urban migration are likely to be further destabilising factors to the social, political, and economic equilibrium in the targeted areas.

#### Additionality:

Through the participatory development of climate-informed community adaptation plans to identify short- to long-term adaptation strategies evidence-based, and the support for implementation of identified adaptation solutions and livelihoods diversification, climate-related risks facing poor smallholders will be reduced. The productive assets developed under Component 2, such as erosion control and catchment rehabilitation above the village water tanks, restoration of the functioning of those tanks, and implementation of the project's approach to ecological agriculture, the natural resource base upon which local livelihoods depend will be enhanced. Local capabilities to resist weather shocks such as drought and flooding, as well as longer-term changes such as increased average temperatures and increasingly erratic rainfall, will be improved. These positive impacts will be further enabled through support for improved natural resource management, and training and technical packages to promote good agricultural practices (GAPs), towards sustainable and climate-resilient agricultural livelihoods. During awareness raising associated with the community adaptation planning, emphasis will be placed on the short- and long-term impacts of and potential solutions for the increasing heat stress – on humans, animals and vegetation – experienced in the project localities. Community members will be assisted to develop financial strategies to ensure long term sustainability of their adaptation plans, including through financial literacy training and increased linkages between community members and existing financial services. In this way, individuals and community-based organisations such as farmer groups can enhance their access to microcredit and saving products, as well as existing microinsurance schemes. This will help them to build their financial reserves and provide a way out of the ongoing cycle of coping and loss of productive assets experienced by many. To provide additional pathways out of poverty and towards climate resilient livelihoods, farmers (women, men, youth) will be trained and equipped to develop and implement diversified farm and non-farm livelihood options. This could include improved storage facilities, introduction of post-harvest technologies, and strengthening of market linkages. Farmgate level processing and marketing will focus *inter alia* on varieties like millets and pulses that are highly nutritious as well as climate resilient, and that have high potential for primary processing. As a result of this, farmers will be able to increase nutritional outcomes and food security for their families, as well as greatly improved household incomes, that are more diversified and therefore more sustainable.

### **K. Sustainability of project outcomes**

Community consultation during the development of this CN, and of the full proposal, and community participation during implementation, is an important aspect of the sustainability strategy. Consultation and participation are important to ensure that the project components and activities directly address the adaptation needs of different community members, disaggregated according to gender, age group, livelihoods and vulnerability group, etc. It also assists to develop community members' ownership of the proposed intervention, which is critical to ensure that any assets developed are maintained beyond the life span of the project. Moreover, community interest and involvement will greatly influence government counterparts (hydromet agencies and others) to sustain the efforts. Strong participation on the part of affected communities is a thread that will run throughout the project. Under Component 1, this will be specifically stimulated through the participatory development of last mile climate services to respond in a targeted fashion to the differentiated needs of different groups of poor and vulnerable people, and their varied livelihood systems in the project localities.

The project builds on lessons learned and activities implemented by the GoSL, GoI, WFP and their partners. This includes initiatives in Malawi, Tanzania, Niger, Senegal and Zimbabwe where WFP has expanded resilience building to include tools and knowledge to allow communities to prepare for, and deal with the impacts of climate-related hazards. In such projects, community consultations were key to deciding the approach and format of climate services involving the community, including religious and cultural leadership, so that the project outcomes are culturally acceptable and appropriate and therefore more sustainable.

Developing a system to institutionalise LMCS within two countries and share lessons regionally is an innovative way to sustain the benefits beyond the lifespan of the project. Many projects pilot activities in one particular place,

with no provisions for institutionalization of any systems developed, and thus there are limited benefits post-project. Since this is a regional project with multiple implementation localities, this is an innovative way to sustain and scale out the project results.

Ensuring maintenance and sustainability of concrete assets developed is a critical element of the project’s exit strategy. For all assets at the farmers’ groups and community levels, the project specific agreements will be developed prior to implementation that spell out arrangements for (i) ownership; (ii) management; and (iii) maintenance, in the interests of sustainability. The latter will thus include considerations of. The exact modality for supply of any machinery – for example milling machines – will be determined during the inception phase, taking into account availability of maintenance in the area and accessibility in terms of costs. Provisions will be developed to ensure that women, youth and people with disabilities benefit equitably in any associated business opportunities. Where agroforestry is implemented or trees are planted under group- or community-management, formal agreements will be discussed during community adaptation planning and developed prior to implementation, that specify clear responsibilities for maintenance, so that trees are able to survive the first couple of years and beyond.

The project will implement a range of activities to advance gender equality as needed for sustained results and climate resilience. These include carrying out a gender assessment during project preparation to assess different needs and barriers of men, women, youth (female and male) and their intersecting identities (age, abilities, location, ethnicity, language, gender, social class), so that project activities can be designed to overcome these, and ensuring that consultations at all levels are undertaken in a gender-sensitive manner. The system of gender-responsive, bottom-up, localised LMCS to be developed will ensure that climate and agricultural advisories are not only actionable in different localities and for different livelihoods systems, but also address the needs and access/capabilities of women farmers as well as men farmers. Under Component 2, during selection of concrete adaptation options, the project will promote gender equality through equal participation of different socio-economic groups such as women and youth (female and male) and their institutions (including local leaders and technical staff from government and partner organisations), to produce community adaptation plans that are relevant to their specific needs and context.

The project team will further refine the exit strategy during full project formulation, drawing lessons from other projects in both countries, as well as from WFP’s global experience.

## L. 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 strengthening capacities to ensure access to last mile climate services for vulnerable communities, disseminating the LMCS through tailored communication channels, supporting institutionalisation of co-produced LMCS, and promoting scaling out by leveraging regional knowledge sharing platforms. These activities are intrinsically risk-averse with respect to social and environmental impacts. Targeted LMCS and associated knowledge will be integrated into activities of Component 2, to provide a solid basis for climate-resilient asset creation and livelihoods diversification, through value-addition to agricultural products and associated entrepreneurial development. Concrete assets to be developed under Component 2 will be prioritised through community-based planning during project implementation.

Due to the unidentified sub-projects (USPs) of Component 2, the project is categorized to be “medium risk”, or category B. An Environmental and Social Risk assessment, in compliance with the ESP Policy of the Adaptation Fund will be carried out during project preparation and a risk management plan developed, with related indicators, budget, clear roles and responsibilities. Concrete adaptation options and assets will be small-scale and developed at household or community level, thus the project is expected to be classified as low or moderate risk.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
<i>Compliance with the Law</i>	<b>X</b>	<b>Low/no risk:</b> Relevant national, regional and district authorities have been/will continue to be consulted during proposal development to ensure compliance with all relevant laws.
<i>Access and Equity</i>		<b>Low/no risk:</b> Through in-depth consultations with communities and stakeholders

		throughout proposal development and project implementation, this project will ensure that no activity will interfere with access to basic services or exacerbate existing inequities. The project will promote equitable access to activities and assets by women and youth in project areas.
<i>Marginalized and Vulnerable Groups</i>		<b>Low/no risk:</b> Marginalized and vulnerable groups – including women, youth, the elderly disabled people, different castes and PVTGs - will be consulted during proposal development to ensure that their identified threats, priorities and mitigation measures are reflected. This project will empower vulnerable groups to make decisions on concrete adaptation actions, valuing their traditional and local knowledge.
<i>Human Rights</i>	<b>X</b>	<b>Low/no risk:</b> 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.
<i>Gender Equity and Women's Empowerment</i>		<b>Low risk/moderate risk:</b> The project will fully mainstream gender, and will ensure that women and men and female and male youth equitably engage in and benefit from project activities such as concrete asset building and climate-resilient livelihoods diversification. The project's gender mainstreaming strategy is a central element of the exit strategy, which will be further elaborated during full proposal development. A gender assessment will be conducted and women and women's groups will be intensively consulted during further design and implementation of the project. The Gender Assessment recommendations will be integrated into the ESMP and will inform implementation. Factors influencing the discrimination against women in terms of access to land and labour force participation could pose some risks of women being excluded from the project's benefits in the long run. These will be further investigated with respect to the project localities and appropriate mitigation measures will be included in the ESMP.
<i>Core Labour Rights</i>	<b>X</b>	<b>Low/no risk:</b> 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 uncommon in the targeted areas, particularly in the agriculture sector, but WFP will seek to promote school attendance, linking the beneficiaries' HHs to the school-based programme's activities in the countries.
<i>Indigenous Peoples</i>		<b>Low/no risk:</b> The Veddha indigenous people in Sri Lanka are found mainly in forested areas in the south-central regions, and thus it is unlikely any of the project localities will include this group. In Odisha, the project localities will include people from the PVTGs, and a Free, Prior and Informed Consent (FPIC) process will be carried out during full project formulation. 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.
<i>Involuntary Resettlement</i>	<b>X</b>	<b>No risk:</b> The project is not expected to lead to involuntary resettlement, neither in physical nor economic terms.
<i>Protection of Natural Habitats</i>		<b>Low/no risk:</b> By implementing adaptation activities consistent with EbA, such as SLM and agroforestry, the project will ensure the protection of natural habitats. In addition, consultations with government stakeholders and communities will ensure that conversion or degradation of critical natural habitats (including those that are legally protected, officially proposed for protection, recognized for their high conservation value, or recognized as protected by traditional or indigenous local communities) is avoided. Component 2: perform social and environmental screening of activities.
<i>Conservation of Biological Diversity</i>		<b>Low/moderate risk:</b> Some activities of Component 2, such as agroforestry and 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, further assessment will be carried out during full proposal development. 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 relevant authorities and research institutes. As a result, the project is not expected to have any adverse impact on the environment or biodiversity. Moreover, these activities are of small-scale (managed at individual, household, or community level) and any residual impact on the environment or habitats would be negligible and readily remediable. <b>Avoidance measures:</b> - No introduction of alien crop/plant species; - No activity in conservation areas and/or natural reserves
<i>Climate Change</i>	<b>X</b>	<b>Low risk:</b> 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 carbon sink capacity. Many project activities will be designed to be low-emissions, as well as adaptive – e.g. the increase in vegetative cover during rehabilitation of catchments above irrigation reservoirs, SLM asset building and promotion of renewable energy for any buildings that

		are developed/rehabilitated. 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 long-term climate change, and short -and medium-term climate variability. The promotion of: i) good agronomic practices for better soil and water management; ii) Integrated pest management coupled with using organic fertilizers; iii) the increase of carbon sinks' potential through tree planting; and iv) promotion of integrated farming system, are expected to reduce agricultural emissions. Plants and crops will be selected for good adaptability to current/projected climate.
<i>Pollution Prevention and Resource Efficiency</i>	<b>X</b>	<b>No risk:</b> None of the activities in the project will release pollutants into the air, soil or water. The project will limit the use of agrochemicals in favour of more environmentally sustainable methods while avoiding hazardous materials, or ozone depleting substances. Under Component 2, the project will introduce climate-smart agricultural practices, aimed at reducing the use of pollutants and increasing resource efficiency. These will include the promotion of the integrated farming system, promotion of natural/ low impact solutions to increase agricultural productivity (e.g. compost, agroforestry) and to combat pests (e.g. integrated pest management).
<i>Public Health</i>	<b>X</b>	<b>Low risk:</b> The project will not have any detrimental effect on public health. The emphasis on raising awareness of the impacts of and adaptation responses to heat stress can be expected to result in an increase in health outcomes. Project activities will promote increasing agricultural production and processing, and cultivation and consumption of nutritious crops, and thus will contribute to tackling the underlying causes of malnutrition. Particular attention will be given to activities related to water harvesting and storage, so that these do not result in an increase in vector-borne disease. Communities will be sensitized on using and storing water in a safe and efficient way. None of the activities in the project involves the use of equipment, materials or transportation that could pose a risk to community health or safety. The rehabilitation of multi-purpose micro irrigation reservoirs could potentially increase existing levels of transmission of water-borne or water-based diseases, but this can be avoided by adding indigenous larvae-eating fish to the ponds. Also, depending on the level of depth, the water ponds may represent a risk of drowning for children. The multi-purpose use of water should be specified during implementation, and any practice, which could be risky for human health, should be discouraged as appropriate. Post-harvest storage facilities will be small-scale structures to be established mainly at households' level. Beneficiaries will be trained on correct hygiene practices to avoid any form of contamination or alteration and ensure good quality of the stored products. <b>Mitigation measure:</b> <ul style="list-style-type: none"> <li>- Add indigenous larvae-eating fish species that feed on mosquito larvae to the water ponds;</li> <li>- Awareness and signs indicating the risk of drowning and the water depths</li> </ul>
<i>Physical and Cultural Heritage</i>	<b>X</b>	<b>Low/no risk:</b> Component 1 will ensure traditional knowledge from local smallholders is valued and incorporated into LMCS through the co-production process. The rehabilitation of micro irrigation reservoirs (Component 2) will result in conservation of cultural heritage, as these are significant cultural artefacts. For example, the tank-based irrigated agricultural system in the Dry Zone of Sri Lanka is one of the oldest historically evolved agricultural systems in the world, which can be traced back nearly two millennia. <sup>171</sup> During community adaptation planning, the project will seek to understand the role of traditional and local knowledge and how it can be blended with scientific information for climate resilience. 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.
<i>Lands and Soil Conservation</i>	<b>X</b>	<b>Low/no risk:</b> 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. Afforestation activities will additionally support protection and enhancement of lands and soil. Component 2 will promote, amongst others, soil and water conservation management practices aiming at restoring degraded land and improving ecosystem-based services. All activities are of small-scale (managed at individual, household, or community level) and any possible residual impact would be negligible and readily remediable.



<sup>171</sup> Abeywardena et al (2019), available at [https://www.researchgate.net/publication/331036265\\_Indigenous\\_Agricultural\\_Systems\\_in\\_the\\_Dry\\_Zone\\_of\\_Sri\\_Lanka\\_Management\\_Transformation\\_Assessment\\_and\\_Sustainability](https://www.researchgate.net/publication/331036265_Indigenous_Agricultural_Systems_in_the_Dry_Zone_of_Sri_Lanka_Management_Transformation_Assessment_and_Sustainability)

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

### A. Record of endorsement on behalf of the government

Dr. Anil Jasinghe, Secretary, Ministry of Environment of Sri Lanka	Ms. Richa Sharma, Additional Secretary, Ministry of Environment Forest and Climate Change
Date: August 03, 2021	Date: August 09, 2021

### B. Implementing Entity certification

<p>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 (<i>Climate Change Policy (2012)</i>, <i>the National Adaptation Plan for Climate Impacts (2016-2025)</i>, <i>the National Climate Action Plans prepared by the Ministry of Environment, National Climate Change Adaptation Strategy for Sri Lanka 2011-2016-Ministry of Environment, National Disaster Management Policy of Sri Lanka</i>) and subject to the approval by the Adaptation Fund Board, <u>commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund</u> and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.</p>	
 <b>Andrea Berardo a.i.</b> <b>WFP Representative</b> <b>Sri Lanka.</b>	 <b>Bishow Parajuli</b> <b>WFP Representative</b> <b>India.</b>
Date: 09 August 2021	Date: 09 August 2021
Tel. and email: +94 112 555250 (ext.2110) andrea.berardo@wfp.org	Tel. and email: +91 11 46554000 (Ext 2100) bishow.parajuli@wfp.org
Project Contact Person: <b>Rushini Perera</b>	Project Contact Person: <b>Pradnya Paithankar</b>
Tel. and Email: +94 112 555250 (ext.2000) rushini.perera@wfp.org	Tel. and Email: +91 11 46554070 (Ext 2700) pradnya.paithankar@wfp.org

ऋचा शर्मा  
RICHA SHARMA



अपर सचिव  
भारत सरकार  
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय  
Additional Secretary  
Government of India  
Ministry of Environment, Forest  
and Climate Change

Letter of Endorsement by the Government of India

9<sup>th</sup> August, 2021

To:

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

**Subject:** Endorsement for Project Concept: Strengthening resilience of vulnerable communities in Sri Lanka and India to increased impacts of climate change.

In my capacity as Designated Authority for the Adaptation Fund in India, I confirm that the concept note of the above regional project 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 India.

Accordingly, I am pleased to endorse the above concept note with support from the Adaptation Fund. The full proposal will be developed in consultation with the Ministry of Environment, Forest and Climate Change. If approved, the project will be implemented by UN World Food Programme and executed jointly by the Government of India based on the priorities in this sector.

Yours sincerely,

( Richa Sharma )  
Additional Secretary  
Ministry of Environment, Forest and  
Climate Change  
Government of India and  
National Designated Authority for  
Adaptation Fund in India





පරිසර අමාත්‍යාංශය  
சுற்றுடல் அமைச்சு  
Ministry of Environment

"සොබාදාම පියස", අංක 416/සී/1, රොබට් ගුනවර්ධන මාවත, බත්තරමුල්ල, ශ්‍රී ලංකාව.  
"சொபடாம் பியச", இல. 416/சி/1, ரொபர்ட் குணவர்தன மாவத்தை, பத்தரமுல்லை, இலங்கை.  
"Sobadam Piyasa", No. 416/C/1, Robert Gunawardana Mawatha, Battaramulla, Sri Lanka.  
Gen. Tel. +94-11-2034100

ලේකම්  
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මගේ අංකය  
எனது இல  
My No

04/04/07/272-II

ඔබේ අංකය  
உமது இல  
Your No

දිනය  
திகதி  
Date

03.08.2021

The Chairman  
The Adaptation Fund Board  
c/o Adaptation Fund Board Secretariat

Dear Sir,

**Endorsement for Concept: Regional Project on  
Strengthening resilience of vulnerable communities in Sri Lanka and India  
to increased impacts of climate change**

In my capacity as designated authority for the Adaptation Fund in Sri Lanka, I confirm that the concept of the above regional 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 Sri Lanka.

Accordingly, I am pleased to endorse the above project concept note with support from the Adaptation Fund. If approved, the project will be implemented by UN World Food Programme and executed by the Government of Sri Lanka.

Thank you

Yours sincerely

  
**Dr Anil Jasinghe**  
Secretary



**Project Formulation Grant (PFG) – Phase II**

Submission Date: 9<sup>th</sup> August 2021.

**Adaptation Fund Project ID:**

**Countries:** Sri Lanka, India

**Title of Project/Programme:** Strengthening resilience of vulnerable communities in Sri Lanka and India to increased impacts of climate change

**Type of IE (NIE/MIE):** Multilateral Implementing Entity (MIE)

**Implementing Entity:** United Nations World Food Programme (WFP)

**Executing Entities:** Sri Lanka: Ministry of Environment.

India: Ministry of Environment, Forest and Climate Change.

**A. Project Preparation** Please confirm the dates

Start date of PFG	<b>1 November 2021</b>
Completion date of PFG	<b>1 November 2022</b>

**B. Proposed Project Preparation Activities (\$)**



List of Proposed Project Preparation Activities	Output of the PFG Activities	USD Amount
<p>Consultations with communities and key stakeholders.</p> <ol style="list-style-type: none"> <li>1. Consultation with the technical teams in both the countries</li> <li>1. Consultations with members of the community through the use of participatory techniques</li> <li>2. Consultations with national governments, local actors, and relevant stakeholders on a binational level</li> <li>3. Process of Free, Prior, and Informed Consent (FPIC) with Particularly Vulnerable Tribal Groups (PVTGs) in India.</li> <li>4. Validation of the complete proposal with national and territorial governments, local governments, and communities</li> <li>5 Organizing a regional consultation workshop between the two governments</li> </ol> <p>The budget may also cover the cost of translating the final reports into English (where necessary). A Climate Change Adaptation specialist will be hired to support the implementation these activities.</p>	<p>Community Consultation Report Stakeholders Consultation Report Final project proposal developed taking into account technical climate change adaptation inputs as well as the perspectives of all stakeholders.</p>	35,000

<p>Development of the full project proposal, which includes conducting studies and assessments, including those on marginalized and vulnerable groups, indigenous peoples, natural habitat protection and conservation, environmental and social risk assessment and related management plan, and gender assessment and related action plan.</p> <p>Vulnerability and capacity assessments include the following:</p> <ul style="list-style-type: none"> <li>(i) The assessment of natural habitats and biodiversity, feasibility of various climate resilient crops- traditional practices and beliefs</li> <li>(ii) Mapping of existing schemes and support structures on enhanced livelihoods and agriculture, food security- and their climate responsiveness. Mapping the financial support services that potentially provide risk and crop insurance, financial investments for climate proofing of village level infrastructures</li> <li>(iii) Analysis of agromet and hydromet advisories provided and capacities of the communities to translate that into action- the capacity gaps at various levels</li> <li>(iv) An environmental and social assessment to identify any potential risk and define the most suited measures to mitigate those, their budget and monitoring arrangements and indicators,</li> <li>(v) A gender assessment and related action plan.</li> </ul> <p>A Climate Change Adaptation specialist will be hired to carry out these activities. Other specialists (ESS, gender) might be hired depending on the needs of each Country Office.</p>	<p>Final project proposal and related annexes developed, based on the results of the assessments.</p> <p>Environmental and social risk assessment and environmental and social risk management plan developed.</p> <p>Gender assessment and action plan developed.</p>	<p>42,000</p>
<p>Audit</p>	<p>Report produced</p>	<p>3,000</p>
<p><b>Total Project Formulation Grant</b></p>		<p>80,000<sup>1</sup></p>

<sup>1</sup> Includes WFP Indirect Support Cost of 6.5%

### C. Implementing Entity

This request has been prepared in accordance with the Adaptation Fund Board's procedures and meets the Adaptation Fund's criteria for project identification and formulation

Implementing Entity Coordinator, IE Name	Signature	Date	Project Contact Person	Telephone	Email Address
<i>Andrea Berardo</i> Representative a.i., WFP Sri Lanka		August 9th, 2021	<i>Rushini Perera</i> Programme Policy Officer (Head of Resilience Unit)	+94 112 555250 (ext. 2000)	<a href="mailto:rushini.perera@wfp.org">rushini.perera@wfp.org</a>
<i>Bishow Parajuli</i> Representative & Country Director, WFP India		August 9, 2021	<i>Pradnya Paithankar</i> , SDG Manager (Head of Policy Design Climate Resilience, DRR, SSTC unit)	+91 11 46554070	<a href="mailto:pradnya.paithankar@wfp.org">pradnya.paithankar@wfp.org</a>

## Annex 1 List of national stakeholders contacted

SRI LANKA NATIONAL LEVEL			
Name	Organisation	Position	Sex
Dr. Sunimal Jayathunga	Ministry of Environment	Additional Secretary	M
Mr. Rifa Wadood	Ministry of Environment	Director (International Affairs)	M
Dr. Ajantha Silva	Ministry of Agriculture	Additional Secretary	M
Mr. P. Jayanetti	Ministry of Agriculture	Deputy Director (Projects)	M
Mr. Sisira Ekanayake	Ministry of Agriculture	Deputy Director (Technical)	M
Ms. Kumudini Vidyalankakara	Climate Change Secretariat	Director	F
Dakshika Pathirana	Climate Change Secretariat	Assistant Director	F
Ms. Shyamali Priyanthi	Climate Change Secretariat	Environment Management Officer	F
Ambika Tennakoon	Climate Change Secretariat		F
Dr. Susil Silva	Dept. of Animal Production & Health	Director	M
Ms. Anusha Warnasuriya	Department of Meteorology	Director (Climate Change Research)	F
Dr. I. M. S. P Jayawardena	Department of Meteorology	Director (Weather Forecasting Decision-making)	F
Dr. W.W Weerakoon	Department of Agriculture	Director General	M
Dr. R. Punyawardena	Department of Agriculture	Principle Scientist	M
Dr. H. Kadupitiya	Department of Agriculture	Director (National Resource Management Centre)	M
Mr. J. R Sudasinghe	Department of Agriculture	Director (Extension)	M
Mr. A. L Abeyratne	Department of Agrarian Development	Commissioner General	M
Mr. R. Wijekumar	Department of Agrarian Development	Commissioner (Development)	M
Eng. R. A Senanayake	Department of Agrarian Development	Head of Water Management	M
Eng. N. Sivalingam	Department of Agrarian Development	Deputy Commissioner (Development)	M
Dr. Inoka Suraweera	Ministry of Health	Director (Environmental and Occupational Health Unit)	F
Ms. Hasanthi Dissanayaka	Ministry of Foreign Affairs	Director General (Ocean Affairs, Climate Change, Environment)	F
Mr. R. H. W. A Kumarasiri	Department of National Planning	Director General	M
Ms. M. Gangatharan	Department of National Planning	Additional Director General	F
Mr. Rohitha Wikramasinghe	Department of National Planning	Director	M
Rajitha Kisagothami Lankathilaka Jagoda	Department of National Planning	Deputy Director	F
Mr. Samantha Bandara	Department of External Resources	Director	M
Mr. Sagara Abeyratna	Department of External Resources	Deputy Director	M
Dr. K. M. A Bandara	Forest Department	Conservator General	M
Dr. K.T. Premakantha	Forest Department	Additional Conservator General	M
Mr. P. Nimal Chandraratne	National Aquatic Resources Development Authority	Director General	M
Mr. H. P Somathilaka	Project Management Unit for WFP, Ministry of Finance	Deputy Director	M
Mr. K. P Nishantha	Project Management Unit for WFP, Ministry of Finance	Deputy Director	M
Mr. D. M. T. U Dissanayake	Wilgamuwa Divisional Secretariat, Matale District	Divisional Secretary	M
Andrea Berardo (and other WFP CO team members)	World Food Programme, Sri Lanka	Deputy Country Director	M
INDIA NATIONAL LEVEL			
Mr. Ravi Shankar Prasad	Ministry of Environment, Forest and Climate Change (MoEFCC)	Additional Secretary	M
Mr. Nagendranath Sinha,	Ministry of Rural Development	Secretary	M
Ms. Alka Upadhyay	Ministry of Rural Development	Additional Secretary	F

Mr. Rohit Kumar	Ministry of Rural Development	Joint Secretary	M
Mr. Dharamveer Jha	Mr. Rohit Kumar	Ministry of Rural Development	M
Dr Alka Bhargava	Ministry of Agriculture and Farmers Welfare (MoA&FW)	Additional Secretary (International Cooperation)	F
Ms. Sunita Sharma	MoA&FW	Director (IC)	F
Dr. Ashok Dalwai	MoA&FW	Chairman, Empowered Body, DFI; and Chairman. Commodity Derivatives Advisory Committee (CDAC), SEBI	M
Dr. Mrutyunjay Mahapatra,	Indian Meteorological Department (IMD), Ministry of Earth Sciences (MoES)	Director General Meteorology	M
Dr. S.D. Attri	IMD	Addl DG, Meteorology	M
Dr. K.K. Singh	IMD	Addl DG, In-charge of Agrometry	M
Mr. Anand Kumar Sharma	IMD	SCG	M
Mr. Bishow Parajuli (and other WFP CO staff)	WFP	Country Director	M
<b>ODISHA STATE</b>			
Mr. SK Vashishth	Department of Agriculture and Farmers' Empowerment	Special Secretary	M
Dr. Muthu Kumar	Department of Agriculture and Farmers' Empowerment	Director	M
Mr. Basant Kumar Dash	Fisheries and Animal Resources Development Department	Joint Director	M
Mr. Santosh Kumar Dash	Department of Co-operation	Additional Secretary/ Managing Director Markfed, Odisha	M
Mr. Kamal Lochan Mishra	Odisha State Disaster Management Authority	Executive Director, OSDMA	M
Mr. Manu Das	National Bank for Agriculture and Rural Development (NABARD)	AGM	M
Mr. Kailash Dash	Regional Centre for Development Cooperation (RCDC)	Executive Director	M
Mr. Jagannath Chatterjee		Documentation Manager	M
Akshay Biswal	Oxfam		M
Dr. Bama Shankar Rath	Odisha University of Agriculture and Technology	Head, Agromet Department	M
Mr. Ashok Singha	CTAN (NGO/think-tank)	chief Executive officer	M
Mr. Ambika Nanda	TATA Steel	Head Corporate Social Responsibility	M
<b>TAMIL NADU STATE</b>			
K.V.Girdhar	Department of Environment (DoE)	Director	M
J. Jayakanthan	Fisheries Department	Commissioner	M
Gagan Deep Bedi	Department of Agriculture	Principle Secretary	M
CM Muralidharan	Food and Agriculture Organisation (FAO)	Consultant for South Asia	
Prof Ramachandran	Centre for Climate Change and Disaster Management (CCCDM), Anna University	Head	M
P. Kannan	DRDA ( <i>District Rural Development Agency</i> )	Assistant Project Officer	M
S. Shanmuganathan	Block Ramanathapuram	Block Development Officer	M
A. Natrajan	Block Ramanathapuram	Block Development Officer	M
M. Arun Prasath	Block Ramanathapuram	Assistant engineer	M
S. Vignesh	Block Ramanathapuram	Assistant engineer	M
R. Annapoornadevi	Block Ramanathapuram	Junior engineer	M
Dr. Murali KS	MS Swaminathan Foundation	Executive Director	M
Dr Rengalakshmi	MS Swaminathan Foundation	Scientist- lead Climate Change Adaptation	F
Dr. Velivezhi	MS Swaminathan Foundation	Lead Fisheries	F

## Annex 2 Report on community consultations in Sri Lanka and India

### 1. Revised approach to community consultations

The community consultations carried out in order to design this Concept Note adopted the revised approach set out in Part II.I of the CN, in response to the restrictions and lockdowns associated with the coronavirus pandemic. The consultations focused on: (i) Basis of livelihoods in the area / community, disaggregated (women, men, female youth, male youth, elderly people, vulnerable groups); (ii) Perceived impact of climate change, and environmental challenges/opportunities, disaggregated; (iii) Support from external agencies, disaggregated; (iv) Coping mechanisms, disaggregated; and (v) Adaptation gaps / needs, and recommendations from community, disaggregated. Primary information was gathered on these themes. Despite limitations in size, time and ability to have separate meetings with different groups due to Covid restrictions, the in-person consultations still resulted in appropriate information to endorse and further develop the approved pre-CN into the current CN. A more detailed report on the community consultations carried out in each country is also available.

### 2. In-person consultations carried out

The following in-person community consultations were carried out in the **Dry Zone of Sri Lanka**:

- Matale district, in the dry zone division of Wilgamuwa, on 23 April 2021, gathering 34 farmers: men (17) and women (17), of all age groups, and a vulnerable group, as enumerated in the table below.

	Youth 18-25 y		Mid 26-60 y		Elderly 61+ y		Vulnerable groups (all ages)	
	Men	Women	Men	Women	Men	Women	Men	Women
Number	0	1	9	12	3	1	5	3
	0%	3%	26%	35%	9%	3%	15%	9%

A village context analysis (VCA) was conducted in the Dry Zone for the Last Mile Climate Services (LMCS) pilot project implemented by the WFP Sri Lanka Country Office, which yielded directly relevant community-level information. The VCA survey was administered to 170 community members in two and three Grama Niladhari divisions in Monaragala and Mullaitivu districts, respectively.

The following in-person community consultations in the **eastern states of India** were carried out:

- Tamil Nadu: meeting held at the Horticulture park, Valantharavai Village, Mandapam block, Ramanathapuram District, on 29 January 2021
- Tamil Nadu: meeting at Thangachimadam Village, Mandapam block, Ramanathapuram District, on 29 January 2021
- Odisha state: community consultation at the Balabhadra Patna Multi-Purpose Cyclone Shelter in Brahmagiri Block of Puri district, on 15 January 2021, with participants from four Gram Panchayats

Venue	Date	No. of women	No. of men	Total participants
<b>TAMIL NADU STATE</b>				
Horticulture park, Valantharavai village, Mandapam block, Ramanathapuram District	29/01/2021 9.30-11.30	22	14	36
Thangachimadam Village, Mandapam block, Ramanathapuram District	29/01/2021 11.30-13.30	8	24	32
<b>ODISHA STATE</b>				
Balabhadra Patna Multi-Purpose Cyclone Shelter, Brahmagiri Block, Puri district	15/01/2021	30	18	48
		<b>60</b>	<b>56</b>	<b>116</b>

### 3. Agriculture and other livelihoods

**Tamil Nadu** Valantharavai village, Tamil Nadu: Agriculture is the primary livelihood in the village, which is comprised of 25 hamlets. The village has 484 hectares (ha) cultivated land of which 88.64 percent is under rainfed cultivation. The area under cultivation has declined by up to 60 percent in the last three decades, with

conversion of agricultural lands to industries, housing and commercial purposes. Paddy rice, the main crop, is cultivated for one season and remains fallow for the rest of the year. The traditional paddy varieties "*thida kattai* and *matta*", which are tolerant to intra-seasonal drought as well as flooding are cultivated by a large majority of the farmers. Vegetables are cultivated in homestead lands - tomato, brinjal, bhendi (lady finger), etc. The village has 20 percent of dry land where chilies, groundnut, gingelly (sesame), pearl millet and sorghum were cultivated in the past, now these lands are either left fallow or converted into coconut plantation. In the coconut fields, intercropping is practiced with groundnut, cowpea, gingelly, small onion, etc., up to three to five years of planting. Goats, poultry and cows also provide household income. Apart from farming, wage income is the main source of cash income to most families. Women are engaged in mat and basket preparation from palmyra leaves, but do not earn much from this activity due to the limited market, as well as availability of the leaves. Basketry is not economically viable, as palmyra trees are decreasing because people cut it for very low returns (Rs 100 per tree).

Thangachimadam Village, Tamil Nadu lies in the middle of Rameshwaram island, where the primary occupation is marine fishing. Both men and women fishers are in a vulnerable condition due to uncertainty in income generation through restrictions on fishing days, types of boats permitted to go to certain distances, etc., diminishing fish stocks, exploitation by middlemen, recurrence of natural hazards, and low economic viability. There is a lack of alternate livelihood options.

**Odisha:** Most of the participants in the consultation stated that they go for the *kharif* (sown at start of summer monsoon, harvested in autumn) crop, and sow paddy rice. Both men and women work. Productivity during the past few years has been reduced due to climate-related disasters, and is insufficient for self-consumption. Thus people depend on small-scale trading and fishing. Most households use traditional methods of cultivation, but mechanisation has started. Almost all households used to have livestock, but now only 10-15 percent of households have animals. Men have control over the produce from the field. With landownership in their names. Men stated that it was not admissible under the norms of Government for this to be in the name of females.

#### **4. Perceived climatic and other changes**

**Sri Lanka Dry Zone:** Matale district, dry zone division of Wilgamuwa: The majority of farmers considered that drought was continuously increasing. In addition, intense rainfall contributed to flash flooding and soil erosion, affecting productivity. The quantity of rainfall received however has diminished over time, while temperature increases are clearly felt. High temperatures during the dry season reduced the ability to cultivate, and also increased water evaporation and loss of soil moisture. The food-insecure season started from December and continued until February (when rainfall gradually decreased). Over the past five years, this has been increasing. The Yala season has been advanced to April from May, giving them less time for land preparation. This created crop losses due to pest attacks and increased the overall cost of production. Regarding environmental problems, the major issues expressed were intermittent rainfall and groundwater depletion, which occurred due to deep bore holes in the localities. Due to sand mining, rivers ran dry more frequently than in previous years.

Findings of the VCA survey: The farmers in both districts are of the view that the weather patterns have changed. Drought in Mullaitivu has become more significant, compared to Monaragala. During the rainy season, flooding too has become worse in Mullaitivu. The constraints faced by the farmers in Yala, 2020 are similar in the two districts. Wild animal damage is perceived to be the most serious, followed by pest attacks, unstable market conditions, and lack of fertilizer. Additionally, lack of irrigation water is a key challenge in Mullaitivu.

**Tamil Nadu:** In Valantharavai village, both men and women farmers identified excessive rain and flooding, salinity, increased frequency of seasonal drought, reduced number of rainy days and increasing dry spells as direct climate risks, and noted that while two decades back, the normal sowing season started in July, it has now completely shifted to September/October, coinciding with NE Monsoon season. Extended dry spells and heavy downpours observed for more than three years have led to crop loss; for the current season this was 40 percent. Unexpected rains and extreme events are increasing, leading to flooding in the agriculture fields, made worse by slow drainage in the fields. Two decades ago they used to receive high-speed winds in late June/early July, but wind speed and duration of windy days has reduced in the recent past. Increasing pests and diseases are an indirect risks of climate change. Increasing infrastructure and industries threaten agriculture in the coastal areas through excessive abstraction of ground water and deteriorating soil and water quality.

In Thangachimadam Village, the diminishing diversity and quantity of the fish resources is due to a mix of climatic and non-climatic factors, such as degradation of coral islands, disappearance of coastal sand dunes, degradation of sea grass and seaweed beds, and sea erosion of the beaches.

**Odisha:** Significant climate change impacts are sea level rise; increased storm intensity, wind and rainfall; extreme droughts and heat waves; and recurring cyclones along the coast.<sup>172</sup> These impacts negatively affect agricultural production, marine fisheries, biodiversity and human health. Participants in the consultation in Puri district confirmed these impacts, stating that the area is highly vulnerable to sea level rise due to the extensive low-lying area, frequent occurrence of cyclonic storms, high rate of coastal environmental degradation and non-sustainable development. Floods associated with heavy rainfall often affect crops and people. Participants did not distinguish between impacts on different groups. However, a 2017 study noted that climate change has a significant impact on activities that are usually the responsibility of women and girls, namely securing household water, food, and fuel. During drought/erratic rainfall, women and girls walk farther and spend more time collecting water and fuel. Girls may have to drop out of school to help their mothers with these tasks, continuing the cycle of poverty and inequity. Due to climate impacts on the health of crops and livestock, women, who often produce the food eaten at home, must work harder for less food.<sup>173</sup>

## 5. Impacts of these changes

**Sri Lanka Dry Zone:** Studies confirm that smallholder farmers cultivating under village irrigation systems are poorer and more vulnerable than those who have access to major irrigation.<sup>174</sup> They have very limited market access, poor basic infrastructure such as roads, drinking water and communication, and are also disadvantaged due to other social and health issues. A delayed monsoon or heavy rainfall during the sowing or harvesting period can damage an entire cropping season. Climate change impacts differently on women and men in the Dry Zone of Sri Lanka. Women traditionally manage household water, family gardens and livestock and are on the frontline of managing impacts of reduced water availability and disaster impacts. This affects their own intra-household food security, which can be exacerbated during extreme climate events and in the aftermath of a disaster. Women take full responsibility for the care of children, persons living with a disability, and the elderly. In some districts, women's carer responsibilities are increased due to large numbers of people living with a disability.<sup>175</sup>

Matale district, dry zone division of Wilgamuwa: The perceived climatic changes noted above are related to increased crop losses, pest attacks and impact on human health. The cost of the food basket has increased over the last decade. Additionally, from 2020 until the present, there was a sharp increase in food prices due to COVID-19 induced economic hardships. This has had a negative result on overall household expenditure patterns which is keenly felt, especially during the dry season. Chronically sick people (kidney disease patients) were unable to continue their agricultural activities or engage in any other work, rendering them more vulnerable.

Findings of the VCA survey: In both districts, more than 75 percent of the farmers are affected by climate hazards; paddy cultivation is the most vulnerable. Farmers faced water rationing and noted difficulty of working in the open areas during drought due to intense heat. For paddy cultivation, farmers noted flooding at unusual times, and rain during harvest time affecting the paddy. For other field crops (OFC), farmers noted prolonged drought and crop loss; water stress causing damage to pods/seeds; heavy insect attacks; fungal diseases due to unusual rain; and increased intense rainfall causing crop loss and soil erosion. Impacts on poultry included diseases due to heavy rains and death of chicks in heat waves. Inland fish production is affected by lack of fish during droughts. Daily wage earners experienced loss of work, both during heavy rain times and droughts; and intense heat in the fields.

**Tamil Nadu:** Irrigation through tanks and canals has significantly reduced in Tamil Nadu in recent decades, leading to more pressure on groundwater, which has also become more saline. Groundwater recharge is largely dependent on the monsoon, changes in which have led to an increasing frequency of droughts. Irrigation through wells has increased from 35.3 percent in 1970s to 60.73 percent in 2015-16. As marginal and small farmers hold nearly 91 per cent of the total holdings in the state and farm 60.6 per cent of the total area, monsoon failure/pressure on water resources ultimately affects them.<sup>176</sup>

Valanthuravai village, Tamil Nadu: Cropping intensity has reduced from two crops to only one per year, affecting households' income and food security. Many households are completely dependent on the rice distributed through PDS, which meets only partial family requirements (5 kg/head/ month). Labour opportunities for men and women are also reduced, pushing men into non-farm employment outside the state or country. Increasing soil salinity has

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<sup>172</sup>Forest and Environment Department, Government of Odisha (2018)

<sup>173</sup>Oxfam review of the Odisha State Action Plan on Climate Change Phase I (2017)

<sup>174</sup> Aheeyar (2012) Climate change adaptation in water management for food security: Recent developments in Sri Lanka. A review of Existing Knowledge and Information. Sri Lanka Water Partnership.

<sup>175</sup> ADB (2015) Country Gender Assessment Sri Lanka, An Update <http://www.adb.org/sites/default/files/institutional-document/172710/sri-lanka-country-gender-assessment-update.pdf>

<sup>176</sup> Palanivelu, K. et al. (2019) Scoping Study Report of Indo-German Project: Water Security and Climate Adaptation in Rural India (WASCA): Tamil Nadu State. Study prepared for GIZ.

increased production risks, especially dry land crops such as chilies, legumes and millets. As a result, women's managerial role in agriculture has increased, on top of their existing social, reproduction and care responsibilities. Area under fallow has increased, leading to invasion by *Prosopis juliflora*; restoration is challenging after one year of fallow. Landless labour communities and other vulnerable groups increasingly depend on irregular non-farm employment outside the village.

Thangachimadam Village, Tamil Nadu: The primary impacts identified by women and men were on the availability of the fisheries resource, which has led to changes in the livelihoods away from fishing, as stated in section 6 below.

**Odisha:** In the Puri district, increased coastal erosion from the Bay of Bengal is causing loss of villages and farmlands into it. Damage to paddy crops and fisheries affects the economy and livelihood of households. High rainfall variability, flash floods, heatwaves in summer, and intense coastal flooding and cyclones result in long periods of food shortage. Participants noted low yield, poor human health, erratic rainfall, and change in vegetation, amongst other climate impacts. Shifting rainfall means the *rabi* season crops (sown in winter and harvested in spring) go dry, and a second crop is impossible. There is a very high percentage of sharecroppers and landless labourers. Community members experience climate change impacts on human health, through increased asthma, respiratory diseases, cardiovascular disease and stroke, food-borne diseases and malnutrition, mental health, etc. The Odisha State Action Plan on Climate Change Phase II notes that "traditionally, in the state females suffer more drudgery and suffer more in fetching water, collecting biomass for cooking and have relatively higher disease burden under similar circumstances due to poor nutrition".<sup>177</sup> During drought years, the workload increases drastically for both men and women, with the new nature of workload affecting women most. When the men migrate in search of work, the temporary single status of women leads to material and sexual exploitation of them on many occasions.<sup>178</sup>

## 6. Response and coping strategies

**Sri Lanka Dry Zone:** Matale district, dry zone division of Wilgamuwa: In response to the lengthening of the food-insecure season, farmers sell valuables and productive assets as a coping strategy and also increase their indebtedness.

Findings of the VCA survey: Overall, farmers are aware of climate change adaptation practices. However, knowledge on farm water management needs improvement. Some farmers seek to use traditional sources of information to predict rainfall patterns such as wind patterns and cloud formation however, some farmers were of the opinion that over the years, these weather patterns are changing, which would be an indication that traditional knowledge alone may not serve them well in future cultivating seasons.

**Tamil Nadu:** Valantharavai village, Tamil Nadu: Men and women farmers and agriculture labourers adopt diverse and multiple adaptation strategies to cope with the negative impacts, by changing agronomic practices at the individual level. These decisions are also governed by changes in socio-economic issues such as access to labour in the households, practices adopted in the neighboring land, etc.: Coping strategies include migration of men to non-farm sectors for employment - other states and countries; increasing number of goats and poultry in the household to reduce the risk inherent in crop cultivation, as well as ease in management of small ruminants compared to cropping; diversifying the homestead gardens with trees and vegetables for regular income by women<sup>179</sup>; seeking off-farm employment from government schemes by women – MGNREGA; and changes in the cropping system to long-term crops like coconut intercropped with cowpea, groundnut, etc.

Thangachimadam Village, Tamil Nadu: Predominant changes in livelihoods adopted by male fishers as a result of the reduced resource availability are becoming fishing labourers (in situ or migration), and diversifying into non-fishing sectors such as petty shops, drivers, and mechanics. Women in fishing households engage in economic activities such as mat weaving, fish vending, dried fish preparation etc., and participate in MGNREGA works. Women's dependence on micro credit is high. Recently there has been a surge in the suicide rate due to the economic crisis. Some families (men and women) are engaged in seaweed cultivation.

**Odisha:** As household level production is inadequate, families supplement their income and food from social safety net schemes such as PDS, school feeding and supplementary nutrition schemes for pregnant/lactating mothers and children, borrowing money from local money lenders, or developing other coping mechanisms. Most families do have MGNREGA cards, but the number of days of employment is not guaranteed. In the Puri district,

<sup>177</sup> Forest and Environment Department, Government of Odisha (2018) Odisha Climate Change Action Plan 2018 – 2023, page 160.

<sup>178</sup> Oxfam India and CYSD (2017) A review of Odisha State Action Plan on Climate Change: special focus on women and children.

<sup>179</sup> Both livestock and homestead resource management are easier for women to manage along with household and care of elders/children at home.

migration to outside states has become rampant in response to climate stresses. Women stated that they are particularly impacted when their (male) family members migrate to economically viable towns.

### **Climate information and services**

**Sri Lanka Dry Zone:** Matale district, dry zone division of Wilgamuwa: The majority of farmers agreed that they did not especially regard weather advisories as they do not receive any detailed or localised information at present. Radio and TV broadcast of weather advisories are their main source of getting the information. There is limited mobile network penetration in the locality and smart phones are virtually unavailable. This is further compounded by the very low mobile signal coverage in the area. All farmers said they would like to receive short-term disaster information in advance within 1-5 days of the event, which would help them to prepare adequately. At present, the Department of Agrarian Development provides longer-term seasonal received predictions from the Met Department at the pre-seasonal meeting ahead of each season, however these are not fully localized to the context. There was generally a lack of trust in weather bulletins, due to past adverse experiences. SMS messages were preferred as most people had only analogue mobile phones.

Findings of the VCA survey: Overall, seasonal forecast is provided to about 20% of the respondents. Rainfall and temperature are the most important weather parameters for them. Farmers prefer to have short-term and long-term weather forecast about 3-10 days in advance. The farmers' common method(s) of receiving information are television and mobile telephones in both districts; Krushi (agriculture) radio and newspapers are also common in Mullaitivu and Monaragala. In both districts, people prefer to receive information mainly by meeting in-person, by telephone and by posters and leaflets displayed, in the predominant language of the area. Overall satisfaction level with Agromet service differ with 21% and 42% of the farmers reporting satisfaction in Monaragala and Mullaitivu districts, respectively. Most respondents reported not being aware of the types of Agromet services provided and the sources of information.

**Tamil Nadu:** Valanthuravai village, Tamil Nadu: Participants stated they have limited access to extension services; and information, awareness and access to different entitlement schemes and services are inadequate. Villagers have access to generic climate information through mass media (TV and radio), but this is not adequate to meet the challenges in the existing livelihoods. Relevant advisories are needed to manage climate variability/change; advisories by agromet services are often very generic and high level and not usable by the community.

Thangachimadam Village, Tamil Nadu: No specific information received during consultation. Extreme event alerts are received, and information is provided on restricting the movement, etc.

**Odisha:** People access Government support – soft credit, inputs, etc. for agriculture and livestock. Mobile penetration is high, and people would like to receive relevant climate advisories. There are currently no climate advisories for slow onset events. More accurate availability and use of weather information is needed to enhance adaptation. Women in Odisha have considerably less access than men to critical information on weather alerts and cropping patterns, affecting their capacity to respond effectively to climate variability.<sup>180</sup>

## **7. Adaptation Needs**

**Sri Lanka Dry Zone:** Matale district, dry zone division of Wilgamuwa: While farmers did get weather information from the radio and TV broadcasts, they agreed it would be helpful to have localised climate information ahead of the season. Extension services along with the climate advisories are needed, so that farming practices can become productive and efficient. Participants noted the need for other livelihood sources apart from agriculture. Women from farmer households (all age groups) expressed the desire for apparel manufacturing at household level and value addition to agricultural produce. Most of these women had been previously working in apparel manufacturing factories and had lost their jobs due to COVID-19-related economic conditions.

Findings of the VCA survey: Recommendations include enhancing farmers' technical knowledge on water management, soil conservation and climate adaptation practices, establishing model farms to share hands on experience, improved Agromet service, customized sharing of weather information using appropriate technology, further awareness raising on climate change, and relevant training to farmers and officials.

**Tamil Nadu:** Adaptation needs prioritised in research conducted in the coastal districts of Tamil Nadu were public awareness on water conservation; changes in farming practices (e.g. adjusting farming calendars); improving water efficiency, including through soil and water conservation measures; diversification of market and products,

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<sup>180</sup> Oxfam India and CYS (2017)

and a diversified livelihood portfolio, especially for those dependent on fisheries.<sup>181</sup> Even highly vulnerable coastal districts gained adaptive momentum from indigenous technologies, especially water harvesting structures.

Valantharavai village, Tamil Nadu: Participants in the consultations noted the following adaptation needs: access to reliable location-specific advisories at a lead time interval of 1-2 weeks; increasing access to low-interest formal credit, especially for women to diversify into processing; sustainable market links for small ruminants and poultry; restoration of water bodies/provision of check dams to store rainwater; diversification of women's livelihoods by skills development (non-farm/off-farm enterprises) in tailoring, processing of primary agro-products etc.

Thangachimadam Village, Tamil Nadu: Due to increasing climate risks, fishers expressed specific needs, including (i) Building capacity of women fishers on fish processing and value-added technologies with forward and backward linkages; (ii) Sea safety training to manage climate events such as high waves and currents for small scale fishers; (iii) Alternate employment opportunities through vocational training to the youth.

Odisha: Community members noted the following adaptation needs: awareness on climate change and receiving more climate advisories; delta-control; building capacities for cashew nut cultivation, floriculture; developing mangrove and non-mangrove bio-shield to minimize the impact of coastal storms and sea water inundation; breeding salinity tolerant crop varieties for cultivation. Adaptation priorities where gender concerns can be integrated include livelihood-focused, people-centric integrated watershed development programmes in rain-fed areas vulnerable to climatic variations; and developing water-efficient micro-irrigation methods: individual and community farm ponds.<sup>182</sup> Active involvement of women in sustainable forest management is especially important as there is a large tribal population directly dependent on forests, and women mainly collect forest products.<sup>183</sup>

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<sup>181</sup> Ramachandran et al., 2016 'Vulnerability and adaptation assessment a way forward for sustainable sectoral development in the purview of climate variability and change: insights from the coast of Tamil Nadu, India', Int. J. Global Warming, Vol. 10, Nos. 1/2/3, pp.307–331.

<sup>182</sup> According to the Odisha State Action Plan on Climate Change (2018-2023),

<sup>183</sup> Forest and Environment Department, Government of Odisha (2018)