Annex 1. SECAP Review Note

Odisha PVTG Empowerment & Livelihoods Improvement Programme – II (OPELIP-II) - India

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Asia and the Pacific Division
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Department

The SECAP Review note should draw on and be informed by the issues raised in the SECAP background study prepared for the COSOP and publicly available tools and datasets, including audits, surveys and studies that inform on the characteristics of the project location. The preliminary SECAP Review Note should be prepared in parallel to the screening process, and should include an accurate description and delineation of the project to inform characterization, identification of risks and impacts and mitigation measures, to the extent possible. The preliminary SECAP review note is attached to the PCN to be submitted to Operational Strategy and Policy Guidance Committee (OSC).

1. Introduction

[1] This review note forms the basis for compliance with IFAD's Social, Environmental, and Climate Assessment Procedures (SECAP) drawing on the results of an initial screening exercise, publicly available data and information, and environmental and climate-related studies that capture the characteristics of the project location.

[2] This SECAP review note at the concept note stage is prepared to identify potential social, environmental, and climate risks to the project and possible impacts of the Program and recommend technically feasible and cost-effective adaptation and mitigation measures for integration into the Program design.

[3] The Odisha PVTG Empowerment & Livelihoods Improvement Programme (OPELIP)-II aims to enhance living conditions and reduce poverty in the target group households across 14 districts (Mayurbhanj, Keonjhar, Jajpur, Angul, Nuapada, Kalahandi, Sundergarh, Rayagada, Malkanagiri, Deogarh, Dhenkanal, Gajapati, Kandhamal, and Ganjam). The project will deploy community empowerment, natural resource management, livelihood enhancement and food and nutritional security improving activities/interventions to achieve its goals.

[4] Intending to improve the resilience of smallholder farmers and the value chains they work in, the project aims to increase incomes in target households by sustainably increasing cropping intensities and yields from horticulture, diversifying into livestock, facilitating land titles, promoting access to finance, and creating strong market linkages for post-harvest management.

[5] Project components include:

- Component 1: Community empowerment and institutional strenghtening
- Component 2: Household food and nutrition security
- Component 3: Improving agricultural productivity, market linkages and incomes
- Component 4: Programme management, monitoring, evaluation and learning

[6] The project hopes to scale up and improve on the environmental footprint of OPELIP Phase I by:

- Rehabilitating land resources by undertaking soil and water conservation measures, building water harvesting infrastructure and planting tree-based crops that add to the biodiversity of local ecosystems and are based on local traditional knowledge and practices.
- Promoting organic, multi-crop and mixed farming systems which contribute to agro-biodiversity, soil health as well as the adaptive capacities of smallholder farmers.

2. Situational analysis and potential project impacts

[7] Odisha is the tenth largest State in the Indian Union, located on India's eastern coast, surrounded by Jharkhand and West Bengal in the north, in the west by Chhattisgarh, in the south by Andhra Pradesh and in the east by the Bay of Bengal. While Odisha has transitioned from a predominantly agro-based economy, agriculture remains a key sector, with nearly 46.8 per cent of workers employed in the Agriculture and Allied sectors.

[8] Odisha's diverse agro-climatic conditions support the cultivation of a wide range of crops. Rice is the staple food of Odisha, and paddy cultivation is widespread across the state. The major varieties of rice grown include Sona Masuri, Basmati, and local varieties like Hanseswari and Sarada. Odisha also cultivates various pulses such as pigeon pea (tur), black gram (urad), green gram (moong), and oilseeds like groundnut, mustard, and sunflower. A variety of vegetables and fruits are grown throughout the state, including tomatoes, potatoes, brinjal, okra, mangoes, papayas, and bananas. Cash crops like sugarcane, jute, and tobacco are also cultivated in certain regions.

[9] The agriculture sector constituted 22.5 per cent of GSVA in 2022-23 (AE) and is estimated to grow at 6 per cent in 2022-23 in real terms, a growth rate significantly higher than that experienced at the all-India level (3.5 per cent). Active intervention by the state has catalyzed growth in sub-sectors like Fishing and Aquaculture (11.2 per cent in the last ten years). In other sub-sectors like cropping (5.4 per cent), forestry (5.5 per cent) and livestock (2.4 per cent), growth rates have rebounded and returned positive statistics after the shock from the COVID-19 pandemic.[1] In 2021-22, the collective impact of drought unseasonal rain, and Cyclone Jawad in the harvesting period of the Kharif season also led to a contraction in the crop sector.

[10] Poverty remains a challenge for the targeted smallholders under OPELIP-II. A lack of employment-generating activities, skill deficiencies, outmigration to pursue employment options, and lack of gender equality and social inclusion are the key identified social challenges. In the agriculture sector, low productivity, limited diversification, restricted access to reliable irrigation, inadequate management of water sources, inefficiencies across the value chain for important crops, and limited capacities in institutional planning and coordination hamper growth in the sector.

[11] From an environmental and climate risk perspective, Odisha is susceptible to climate-mediated cyclones and coastal erosion. The state’s water resources depend on monsoon rains, so crop production in the state is highly correlated with climate variability. Flash floods during the rainy season and heat waves in the summer adversely impact production levels, food security and nutrition.

2.1Socio-economic assessment

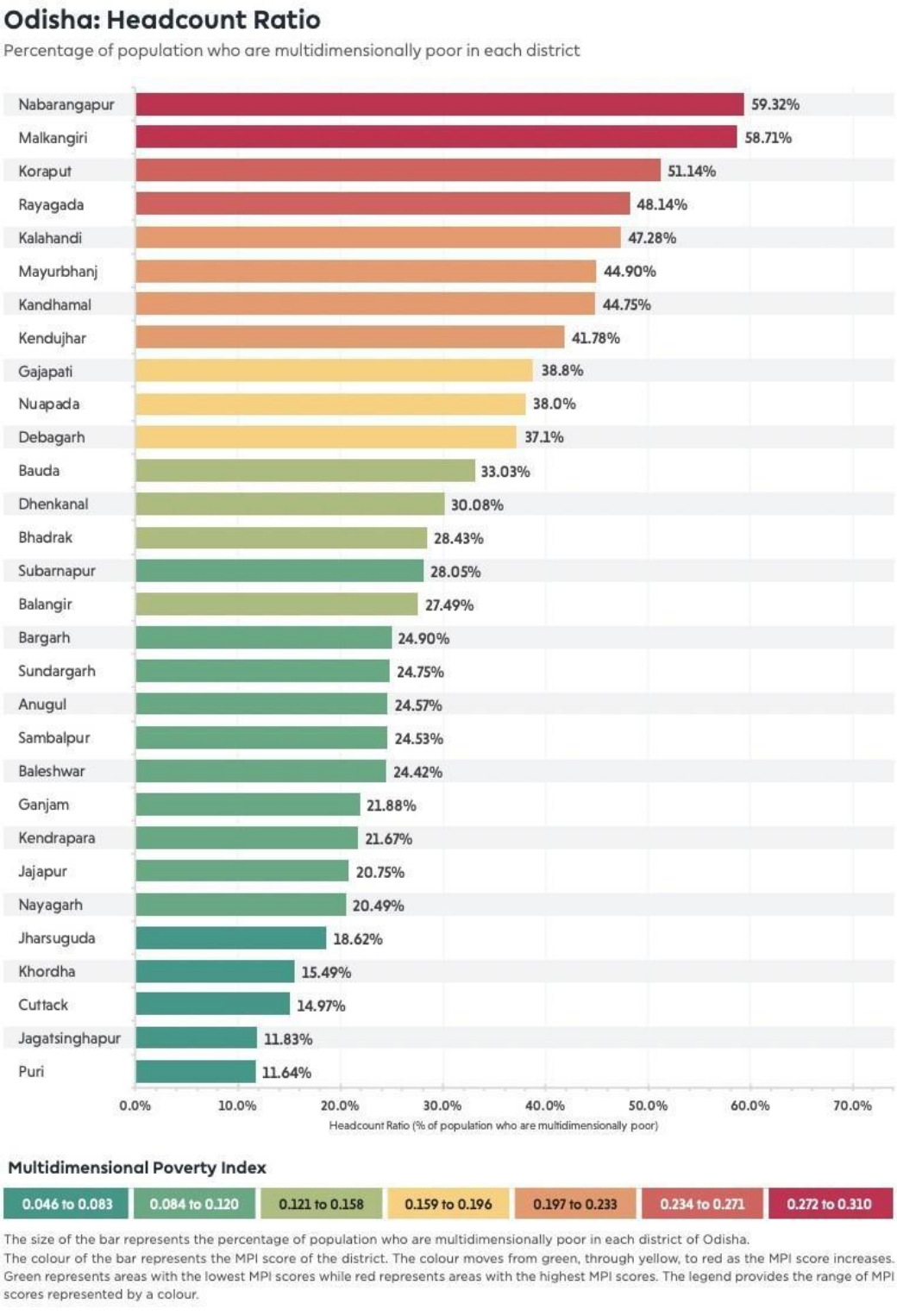
a.Overall poverty situation

[12] In terms of population, Odisha is the eleventh largest, comprising 3.47% of India’s total population, of which more than 83% is rural (Census 2011). Women account for just under half the entire population of the state, with 979 women per 1000 men (Census 2011). Over the years, the share of agriculture in the gross state domestic product has declined from around 37% in 1992–93 to 22.5% in 2022-23, and that of industry and services increased correspondingly. However, despite a declining share of agriculture in GSDP, the number of persons engaged in agriculture remains high.[2]

[13] Odisha’s per capita income has also grown at a double-digit rate of 16.8 per cent in 2021-22, with increasing incomes in agriculture and allied sectors contributing nominally to this growth. In 2015–16, the average monthly income per agriculture household was Rs. 7731 compared to Rs. 8931 at the all-India level according to NABARD’s Financial Inclusion Survey for 2015–16, which is among the lowest in India but is better than the average monthly income in Andhra Pradesh (Rs. 6920), UP (Rs. 6668) and Bihar (Rs. 7175).[3]

[14] As of 2022, India's score on the Multi-Dimensional Poverty Index (MPI) is 0.069[4]. This marks a worsening score, having been 0.121 in 2016[5]. Odisha has been ranked among the nine poorest states in the country by the Global Multidimensional Poverty Index (MPI) 2022 report. Odisha's economy continued the remarkable upsurge post-pandemic, growing at a rate of 11.5 per cent in 2021-22 and 7.8 per cent in 2022-23. These growth rates have not only been significantly higher than that at the national level for the corresponding years but also surpassed the pre-pandemic trend of performance. As a consequence, the state's per capita income has risen to INR 1,50,676 in 2022-23(AE) thereby dramatically shrinking the gap vis-à-vis the national level to half of what it used to be in 2011-12[6].Agricultural wage earners, smallholder farmers and casual workers in the non-farm sector constitute the bulk of poor rural people. Within these categories, women and tribal communities are the most deprived.

Figure 1.



b. Gender

[15] The latest Gender Inequality Index (GII) in 2021 ranked India 122th out of 190 countries with a score of 0.490. This score is better than that of the South Asian region (value 0.508) and close to the world average of 0.465. This reflects the government's initiatives and investments towards more inclusive growth, social protection, and gender-responsive development policies aimedat reducing the gender gap and empowering women in all aspects of social, economic, and political life. However, women's participation in the labour force remains low, and there is a significant pay gap between men and women. India's score of 0.490 in 2022 also registers a slight slippage from 0.493 in 2021.

[16] Despite notable advancements in policy and legislation, women continue to experience significant disadvantages in political, economic, and social spheres when compared to men. Women hold just 14.4% of parliamentary seats as of 2021[7], and the proportion of adult women who have not attained an upper secondary level of education is only 70% as compared to 58% for men[8]. According to a 2021 data from the International Labour Organisation, labor force participation rates stand at 23% for women in India, and 73% for men[9]. India is among medium HDI countries that have seen greater increase in feminist movements. Feminist mobilizations are associated with better legal rights to participate in economic life, greater representation in politics, better support for paid and unpaid domestic care work, better protection from sexual harassment, better access to land tenure, financial inclusion,1 overcoming stigma and raising awareness around violence against women and girls[10]

[17] The National Policy for Women 2016 recognizes that, although there has been progress in women's empowerment, there are persistent socio-economic issues that hinder gender equality and the overall empowerment of women. These challenges include the feminization of agriculture, women's land and asset ownership entitlements, malnutrition, and anaemia, among others. The policy notes that women have been marginalized in climate change management and environmental resource debates, despite the gendered impacts of climate change. To overcome these challenges, the Government of India is working to bridge the gender gap and prioritize women's social and economic empowerment. This includes support for livelihood improvement programs and the promotion of self-help groups, providing women with access to finance, extension services for crop and livestock husbandry, and workload-reducing equipment, leading to improved household incomes and greater decision-making power for women.

[18] Gender equality in Odisha remains a challenge. Women's labor participation rate is lower in Odisha than the national average, and they are paid significantly less than men in similar positions. Furthermore, violence against women remains a pervasive problem in the state, with high rates of domestic violence, sexual assault, and trafficking. Women's voices and influence have been historically limited in Odisha due to patriarchal attitudes and cultural norms. Ideal of women as domestic caregivers run dominant, with privileges of power disproportionately favoring male counterparts, both internal and external to the household.

[19] The state of Odisha has implemented various policies and initiatives to promote gender equality, including the provision of free compulsory education for both boys and girls aged 6-14; the integration of a gender equity curriculum in over 20000 government schools; the establishment of quotas for female representation in political and governmental bodies; and the establishment of women's collectives and self-help groups to promote entrepreneurship and financial independence.

[20] Despite these developments, women continue to be marginalized in many areas, including politics, business, and society at large. There is a need for continued efforts to break down cultural and societal barriers that limit women's participation and influence and to promote gender equality and women's empowerment in Odisha and beyond.

[21] The Gender Responsive Budgeting 2022-23 prepared by the Government of Odisha[11] confirms the intention to translate into budgetary commitments the willingness to address the key challenges faced by girls and women in the State including poverty, inequality and violence.

[22] Tribal women play a crucial role in the conservation and transmission of ancestral traditional knowledge and a collective and community role as caretakers of natural resources and keepers of medicinal and tribal knowledge. Despite their important roles in their communities, tribal women face various challenges from education, health to civil, economic and social rights. Health standards of tribal women is below the national average. Maternal mortality is high among tribal women because of lack of institutional delivery and unawareness of government schemes. According to the Scheduled Castes and Schedules Tribes Research and Training Institutes (SCSTRTI) 2015 report on health status of PVTGs, 38% of women in reproductive age (15 to 49 years) were under-weight, and 3% suffered severe, 22% moderate, and 29% mild anaemia[1].

[23] Lack of education leads to their social and physical vulnerability. Unawareness about their social and political rights leaves them out of decision-making processes and they face discrimination as per their ethnicity. The female PVTG literacy rate as per Baseline Survey, 2018, is 25.55%, which is lower than that of the literacy rate of STs (41.20%) and that of non STSC population is around 64.01 percent at state level (as per 2011 Census).

[24] Early marriage is also a challenge for young PVTG women, according to OPELIP I, girls are often seen married at the age of 14. Tribal women are mainly not engaged in any kind of continuous work and much like their male counterparts are found to work in agriculture. Most of the tribal women work outside their homes and are engaged in various daily labour and agricultural work. Young children and girls go often to the fields with their mothers and most of the time they do not go to school regularly or become drop outs from school. Household works like cooking, cleaning, washing utensils and clothes, collecting fuel for cooking are done by the female members of the family.

[25] Women are actively involved in various agricultural activities, and their contributions are crucial to the success of farming in PVTG communities. Their roles can include land preparation, sowing seeds, weeding, transplanting seedlings, and harvesting crops. Women are also responsible for post-harvest activities, such as threshing, winnowing, and storage of agricultural produce. Women in PVTG villages often play a significant role in preserving traditional seeds and knowledge about local crop varieties. They select, store, and exchange seeds, sharing knowledge to future generations.

[26] Men are often doing seasonal work outside the communities, leaving temporarily the agriculture sector for service and industry, women are being increasingly playing non-traditional roles. Tribal woman's role in decision making, for instance in land development, crop patterns and purchase and management of animals increases, however in many cases the authority and main decision making remains with man. One major livelihood resource for tribal women non-timber forest produce.

[27] Only 33 percent of scheduled tribe women have a mobile phone they themselves use, compared with 46-68 percent of women who belong to any other caste/tribe group. Scheduled tribe women who have a mobile phone that they themselves use are also less likely to be able to read SMS messages (53%) than women who belong to any other caste/tribe group (61-79%)[3].

[28] Gradually tribal women are increasingly enrolled as members of the SHGs, this has been a means to enhance their economic condition and source of empowerment. As per OPELIP I database 7,288 SHGs have been formed; 6578 are functional, noting that members are not utilising the savings for loans and depositing in the bank. Self Help Groups are working holistically to encompass different aspects of empowerment through SHG movements. These include expansion of credit linkage to as many SHGs as possible so that SHGs have paid up capital to start economic activities, through these loan they manage natural resources like (bamboo basket making, khalipatra (leaf plate) stitching, ayurvedic medicine, candle, wood toy, tamarind packing, turmeric grinding and packing) and Snacks making like (papad, badi, and pickle) Domestic Tailoring, Hand Embroidery, Machine Embroidery, Cloth Painting.

C. Youth

[29] India has the largest youth population in the world with one out of every four among the 15-29 years age group globally being Indian. According the National Youth Policy 2014 and the updated policy draft 2021, youth are defined as individuals aged 15-29 years old. This age group constitute nearly 34% of India's total population. It is estimated that India would have 365 million youth by 2030, which constitutes 24% of the population.

[30] Youth in the state of Odisha (15-29 years) make up about 33% of the States' population, while 32% and 29% of women and men, respectively, are in the 25-34 age group. A large youth population provides a huge potential workforce for the state, which if properly educated and trained can make significant contribution to the development of the state. Youth can also lead to creativity and new solutions as youth are often open to new ideas and innovations. In addition, engaging youth in community activities and leadership can support building of a more positive and engaged community in the state.

[31] Youth assessment studies in Odisha have highlighted several challenges faced by young people in the state. One of the primary concerns is the issue of unemployment and underemployment. Despite advances in education and skill development, a significant number of youth struggle to find suitable job opportunities, leading to frustration and disillusionment. Addressing this challenge requires a multi-faceted approach that involves enhancing employability skills, fostering entrepreneurship, and promoting investments in sectors that generate employment. Another critical aspect assessed is the state of education and access to quality learning opportunities. While Odisha has made progress in educational infrastructure, there are still pockets where access to education remains limited. Furthermore, there is a need to improve the quality of education and align it with the demands of the job market to ensure that the youth are equipped with relevant skills.

[32] TRIBAL YOUTH: Odisha State Youth Policy 2013, with a target population ranging from 13 to 35 years, envisions "Young people of Odisha to be fully enabled, motivated, engaged and empowered to accomplish their full potential, have healthy lives, progress far in education, secure productive livelihoods, participate in their communities, have a say in their future and contribute to the growth and development of the state". The policy contains favourable strategies for tribal youths in education, skill development and other areas. STs and SCs constitute 2 separate Key Constituencies of the policy indicating distinct attention of the Government for STs and SCs separately. Few excerpts from Odisha State Youth Policy 2013 are given below.

[33] Youth from ST, SC and the Minorities: Tribal youth suffer from multiple disadvantages, as do youth from SC communities and other religious and ethnic minorities despite several initiatives meant to empower them. Development efforts in regions with concentrations of this sub-population must deliberately reach out to these groups and ensure that they benefit from any youth programmes.

[34] Adolescents may be forced to abandon their studies prior to completion even when they want to continue on account of a number of social and economic circumstances. As a result, they either have nothing to do and thus became vulnerable to negative social influences, or they are obliged to take low skill, low pay jobs to support their families.

[35] As part of the IFAD's Indigenous Peoples Assistance Facility (IPAF), the project "Empowering Tribal Youth for Nutritional Food Security and Income Enhancement in Koraput District of South Odisha", was implemented by PRAGATI Koraput. It targeted the tribal youth and it reported that their aspirations include income stability, security, and a better quality of life, better access to land and capital, modern farming techniques, and more linkages to markets, all these as elements to pathway out of poverty.

[36] Pragati Koraput reported that youth often also lack access to credit, information, extension services and many other productive resources necessary for agriculture. Thus, the majority of tribal youth are unemployed and forced to migrate out to urban areas, work at low paid jobs, and a few even get diverted to illegal activities. Young girls are becoming more vulnerable to trafficking and exploitation.

D. Indigenous peoples

[37] India has several laws and constitutional provisions that recognize Indigenous Peoples' rights to land and self-government, but their implementation is far from satisfactory. The Indian government has voted in favour of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) on the condition that, from independence, all Indians be considered indigenous. In India, Indigenous Peoples (IPs) are recognized as Scheduled Tribes (STs), which internationally are generally referred to as IPs.

[38] India has a tribal population of 104.28 million, and Odisha has the third largest concentration of tribal population in the country (comprising 9.66% of the national tribal population). IPs are concentrated in specific geographic regions. 46.1% of the STs live in the eastern and central region, including Odisha State, where there are 62 STs. Specifically, 22.8 percent of Odisha's total population is recognized as STs (India: Country Technical Note, IWGIA, 2022).

[39] Odisha is home to numerous indigenous communities, each with its own distinct culture, language, and traditions. These cultures are deeply rooted in nature, with many Adivasis having an intimate relationship with the forests and land they inhabit. The indigenous communities in Odisha speak various languages, many of which are classified as Austroasiatic, Dravidian, and Tibeto-Burman languages. Each linguistic group represents a distinct cultural heritage. Traditionally, indigenous communities in Odisha have been dependent on agriculture, forest-based activities, and traditional handicrafts for their livelihoods. Their unique knowledge of medicinal plants, traditional agriculture, and sustainable forest practices has been an invaluable contribution to the region's biodiversity. Indigenous communities in Odisha often have customary laws that govern their communities and their own social structures centrered on collective identity and community cohesion. Despite their rich cultural heritage and contributions to the state, indigenous people in Odisha face numerous challenges. Some of the significant issues include land rights, displacement due to development projects, inadequate access to education and healthcare, and marginalization from mainstream opportunities.

[40] The specification of Scheduled Areas about the State of Odisha is by a notified order of the President vide "The Scheduled Areas (State of Bihar, Gujrat, Madhya Pradesh and Orissa) order,1977 dated 31.12.1977 (C.O. 109) and covers about 44.70% of the area of the state. This area includes the entire districts of Mayurbhanj, Koraput, Malkangiri, Rayagada, Nawarangapur, Sundargarh, and Kandhamals districts, R.Udayagiri Tahasil, Gumma & Rayagada Blocks of Gajapati, Soroda Tahasil, excluding Gazalbadi and Gochha Panchayats of Ganjam district, Kuchinda Tahasil of Sambalpur district, Telkoi, Keonjhar, Champua and Barbil Tahasils of Keonjhar district, Th. Rampur and Lanjigarh blocks of Kalahandi district and Nilagiri block of Balasore district.[12]

[41] In the context of Odisha, PVTG stands for "Particularly Vulnerable Tribal Group." PVTGs are specific tribal communities that are considered to be the most vulnerable among the Scheduled Tribes in India. Out of the 75 PTVGs in India, the eastern state of Odisha in India has the largest number of such groups (13). These groups face severe socio-economic and educational disadvantages, live in remote and difficult-to-access areas, and have unique cultural practices and languages that are at risk of being lost. The classification of PVTGs is based on criteria defined by the Ministry of Tribal Affairs, Government of India, which takes into account factors such as pre-agricultural level of technology, low literacy rates, stagnant or declining population, and lack of access to basic amenities and healthcare. These criteria are used to identify the most marginalized and vulnerable tribal communities across the country, including those in the state of Odisha.

[42] The Government of India, along with the State Government of Odisha, has implemented various welfare and development schemes and programs for the upliftment of PVTGs. These initiatives aim to address their specific needs and vulnerabilities, such as providing access to education, healthcare, housing, clean drinking water, and livelihood opportunities. Efforts are also made to preserve and promote their unique cultural heritage and traditional knowledge.

Despite the challenges, recognizing and supporting PVTGs is crucial for ensuring their socio-economic well-being and preserving their diverse cultural identities. Empowering these communities and involving them in decision-making processes that affect their lives are essential steps toward creating a more inclusive and equitable society in Odisha. The Odisha PVTG Empowerment & Livelihoods Improvement Programme (OPELIP-II) aims to reduce poverty and increase food and nutrition security amongst PVTG households in Odisha.

[43] The project will get participation of indigenous peoples as beneficiaries through indigenous peoples-related activities and involving Free Prior and Informed Consent (FPIC). The focus of the proposed project will be to deepen the impactful interventions of OPELIP and expand to new villages and households, leveraging lessons learned and best practices from Phase I. Respect and support for indigenous peoples' traditional knowledge and livelihoods will be ensured.

D. Marginalised groups

[44] Persons with disabilities: Disability is a multidimensional concept. The United Nations Convention on the Rights of Persons with Disabilities (CRPD) recognizes persons with disabilities as those who have long-term physical, mental, intellectual or sensory impairments that, in interaction with various barriers, may hinder their full and effective participation in society on an equal basis with others. According to the 76th round of the NSO survey[13] conducted between July and December 2018, in India the percentage of persons with disability in the population was 2.2 per cent. 2.3 per cent in rural areas and 2 per cent in urban areas. The same study reported that in rural Odisha persons with disability are 3.7 percent of the male population and 3 per cent of female population. In the case of urban areas an equal share of men and women with disability at 2.8 percent was reported. The project should consider inclusive strategies to benefit persons with disabilities.

E. Nutrition

[45] Malnutrition remains a significant concern, particularly among vulnerable populations such as women, children and marginalized communities in Odisha. Nutrition assessment was conducted through various surveys and studies to gather data on the nutritional status of the population:

[46] i) National Family Health Survey (NFHS): The NFHS is a nationwide survey that provides comprehensive data on various health and nutrition indicators, including child and maternal malnutrition. NFHS-5, conducted in 2019-20, is the latest survey that covers all districts of Odisha.

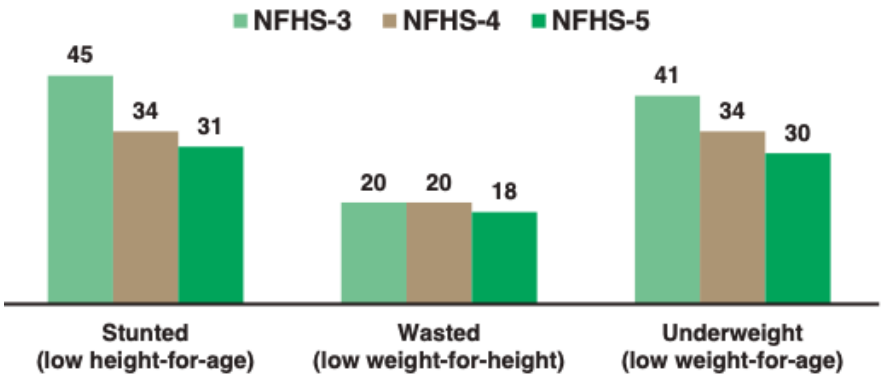
[47] ii) Rapid Survey on Children (RSOC): The RSOC focuses specifically on assessing the nutritional status of children aged 0-5 years. It provides data on stunting, wasting, and underweight prevalence, among other indicators.

[48] iii) Integrated Child Development Services (ICDS) Records: ICDS records are valuable sources of data on the nutritional status of children and pregnant women, as the ICDS program provides supplementary nutrition to beneficiaries.

[49] iv) Food Consumption Surveys: These surveys assess the dietary patterns and food consumption habits of the population, helping identify gaps in dietary diversity and nutritional intake.

[50] Children's nutritional status in Odisha has slightly improved since NFHS-4 by all measures. The percentage of children who are stunted, wasted and underweight decreased marginally from 34 percent, 20 percent and 34 percent to 31 percent, 18 percent and 30 percent respectively in the 4 years between NFHS-4 and NFHS-5.

[51] Figure 2. Trends in Odisha children's nutritional status – Percentage of children under five years



Note: Nutritional status estimates are based on the 2006 WHO International Reference Population

[52] Findings from OPELIP (undertaken by RIA in 2018) found that, on average, the rate of stunting in the areas covered by OPELIP and nearby comparison areas was 36%. Similarly, 33% of children were underweight and 28% children were wasted in the same areas. Further, the survey showed that children from PVTGs households had a higher rate of malnutrition than non- PVTG children. The rates of stunting and underweight among PVTG children were statistically significantly higher than those of non-PVTG children.

[53] According to NFHS-5, about 44 percent of women and 38 percent of men in Odisha are either too thin or overweight. Among women age 15-49, the proportion overweight or obese is 23 percent, which is higher than NFHS-4 (17%). More men are overweight or obese (22%) than thin (15%), which is similar pattern observed in NFHS-4. Twenty-one percent of women in Odisha are too thin. Almost three-fifths of women (56%) and men (62%) are at a healthy weight for their height. Undernutrition is particularly common in the younger age groups (especially age 15-19), in rural areas for women, and among scheduled tribes.

[54] Slightly less than two-thirds of women (64%) in Odisha have anemia, including 29 percent with mild anemia, 33 percent with moderate anemia, and 3 percent with severe anemia. Anemia is particularly high among rural women, women age 15-19 or 40-49, and scheduled tribe women, but anemia exceeds 53 percent for every group of women. Anemia among women has increased by 13 percentage points since NFHS-4. Over one-quarter (29%) of men in Odisha are anaemic. Scheduled tribe men, men with no schooling or less than 10 years of schooling, men age 15-19 or 40-49, and men in rural areas are particularly likely to be anaemic.

[55] The State Government of Odisha has implemented various nutrition-specific and nutrition-sensitive interventions to address malnutrition:

[56] - Mamata Scheme provides monetary incentives to pregnant women and lactating mothers who opt for institutional deliveries at government-approved health facilities. The cash transfer aims to reduce maternal and infant mortality rates by encouraging more women to seek professional healthcare during childbirth. Pregnant women and lactating mothers from economically disadvantaged households are the primary beneficiaries of the Mamata scheme.

[57] Anganwadi and ICDS Programs: The ICDS program, through Anganwadi centers, provides supplementary nutrition to pregnant women, lactating mothers, and children, aiming to improve their nutritional status.

[58] Mid-Day Meal Scheme: The Mid-Day Meal Scheme provides nutritious meals to school children, promoting better nutrition and school attendance.

[59] Nutrition Awareness Campaigns: The government conducts awareness campaigns to educate communities about the importance of balanced diets and proper nutrition practices.

[60] OPELIP II will be implemented as a nutrition sensitive project with several activities responding to nutrition related challenges in the state. These included: home gardening,

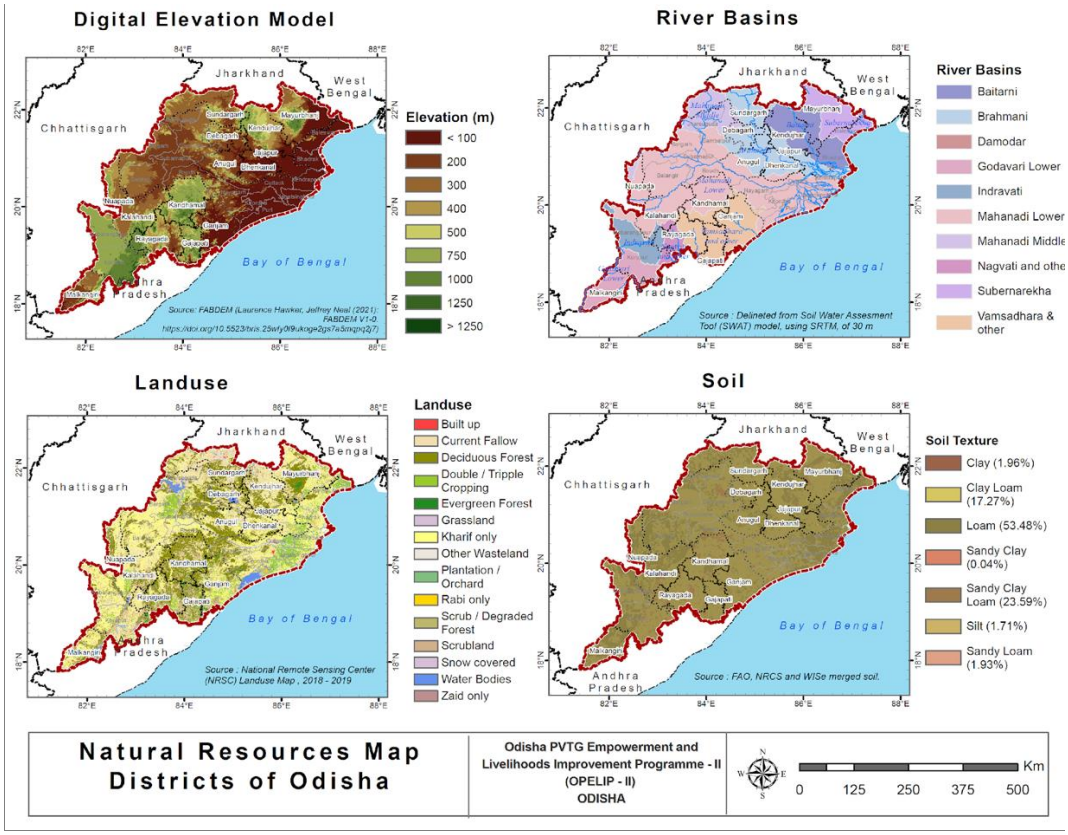
nutrition, reproductive health. A recent study conducted within OPELIP[14] by IFAD (RIA) and CGIAR Research Initiative on National Policies and Strategies showed that home gardens increase food security (household dietary diversity score, home-produced and consumed food), and the dietary quality of men and women, but have no effect on children's dietary quality. Results also suggested that home gardens increase monthly per adult equivalent incomes and reduce the probability of falling below the poverty line. The study concluded that home gardens can improve food security, dietary quality and income in rural farming communities including vulnerable population groups. Findings suggested that home gardens can be a poverty-reducing strategy for resource-poor farmers and vulnerable population groups. However, there is need for complementary interventions to improve children's dietary quality and anthropometry.

2.2 Environment and climate context, trends and implications

[61] Odisha is divided into ten agro-climatic zones based on climate, soil, rainfall, and cropping patterns: northwestern plateau, northcentral plateau, north-eastern coastal plain, east and southeastern coastal plain, north-eastern ghat, eastern ghat highland, south-eastern ghat, western undulating zone, western central tableland, and mid-central tableland.[15] There are two National parks, 18 Sanctuaries and one Biosphere Reserve in the State.

[62] Odisha has a tropical climate characterized by high temperature, high humidity, medium to high rainfall and short and mild winters. The southwest monsoon covers the entire state by mid-June, with heavy rain a regular occurrence between June and September. The winter season settles in the state from the month of November. Odisha's State Action Plan on Climate Change 2021-2030 predicts increasing disparities between temperatures, with maximum temperatures increasing and minimum temperatures decreasing. The action plan also forecasts an increased frequency of extreme rainfall events, such as droughts and floods and warns against intermittent dry spells and unseasonal rainfall.[16]

Figure 3: Physiographic Profile of Districts of Odisha



[63] The table below shows the agro-climatic classification, typology of soil and main crops present in the programme area.

[64] Table 1. Agroclimatic classification of project area:

Agro-climatic Zone as per NARP	**Programme Districts**	**Climate**	**Soils**	**Crops**
North-western Plateau Zone	Sundargarh and Deogarh	Hot & moist sub-humid	Red & yellow, mixed red & black; light texture	Rice, Mustard, Groundnut, Pigeon pea, varieties (black, green, Bengal) of gram, Moong, Pea, Lentil, linseed, jowar, Maize, Niger
North-central Plateau Zone	Mayurbhanja and Keonjhar	Hot and moist sub-humid	Laterites, red loams; light textured	
North-eastern Ghat Zone	Raygad, Gajpati and Ganjam	Hot & moist sub-humid	Brown forest, sandy loam, loamy clay; medium textured	Rice, Maize, groundnut, Seasamum, Mustard, Blackgram, Horsegram, Potato, Pigeon pea, Brinjal, Tomato.
South-eastern Ghat Zone	Malkanagiri	Warm & humid	Red, red & yellow; light textured	Rice, Millets, Sesamum, Mango, Lime Guava
Western Undulating Zone	Kalahandi, Nuapada and Kandhamal	Hot & moist sub-humid	Red, mixed red & black, black; medium to heavy textured	Rice, Smaller millets, varieties (black, green, Bengal) of gram, Finger millets, Sesamum, Maize, Pigeon pea, Mustard, Groundnut, Linseed, Sorghum, Niger, Sweet-potato, Onion, Chilli
Mid-central Table Land Zone	Angul	Hot & moist sub humid	Red loams, lateritic, mixed red & black; light textured	Rice, Pulses, Sesamum, Vegetables

a.Environmental assessment

[65] Red soil characterizes a large portion of Odisha's agricultural land and facilitates the state's production of paddy, mangoes, tomatoes, brinjal, sugarcane, jute, and poultry. Even though paddy is the most cultivated crop with a share of almost 48% in gross cropped area, farming in the state has diversified towards high-value agriculture, including fruits and vegetables and livestock. However, the frequent occurrence of extreme natural calamities like floods, cyclones and droughts drastically impact the state's agriculture sector. In 2019, a devastating cyclonic storm (FANI) caused large-scale destruction, particularly in the Angul, Balasore, Bhadrak, Cuttack, Dhenkanal, Ganjam, Jagatsinghpur, Jajpur, Kendrapara, Keonjhar, Khordha, Mayurbhanj, Nayagarh and Puri districts. While the devastating impact of this cyclone has prompted the state to prioritize expenditure in disaster relief and management (through an SDRMF and NDRMF), the increased frequency and intensity of these events have impeded agriculture growth, lowered farmers' income, and emphasized the need for climate-resilient growth in the state.

[66] Given the nature of the terrain in the OPELIP programme area, there is highvariability in soil types. Typically, the soils found are red, red lateritic, yellow and brown forest soils, black soils in certain patches and alluvial in gentler plateaus and in valleys. The agro-climatic classification presented in Table 1 lists the broad soil types in the programme area. The region is characterised by shallow soil depth. The key feature to note is the high degree of variability within the programme area in a district. Given high rainfall and a sloping terrain, soils suffer considerable leaching, would be acidic and deficient in nitrogen. Soils would tend to have adequate potash, moderate levels of phosphorus and organic carbon because of proximity to forests.

[67] Under OPELIP Phase I, positive impacts on the environment, natural resources and climate change adaptation stem from interventions that supported land titling, invested in irrigation and water harvesting structures, promoted mixed farming with diversified cropping and built on the relationship with International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). The NRM and Livelihoods component of OPELIP ensured secure titles to PTG households on land under their de facto occupation. This incentive enabled them to adopt more sustainable land use regimes and invest in their property. Demarcating community forests on degraded forest land allocated under the Community Rights provision of FRA reversed land degradation and reduced pressure on existing forests. OPELIP also promoted rainwater harvesting and soil conservation activities, such as land levelling, making field bunds, terracing, check dams, etc., which helped reduce soil erosion, improved rainwater percolation, leading to rejuvenation of springs, improvement in micro-climate locally and enhanced availability of surface and groundwater in the post-monsoon period. By developing local, small-scale irrigation infrastructure, the project supported the sustainable intensification of land cultivation, reducing post-kharif fallows that cause soil degradation. Promoting horticulture and resource conservation activities on podu lands also helped reverse land degradation.

[68] OPELIP-II activities will be confined to areas designated for agricultural use and will not involve areas designated for forestry, wetland, and those with high biodiversity values.

b. Landscape and Biodiversity

[69] Odisha is an agrarian state, divided into 4 physiographic Zones: Coastal Plains, Central Table Land, Northern Plateau and Eastern Ghats. The state’s diverse terrain, topography, and varied climatic conditions foster an enabling environment for a unique variety of flora, fauna, ecosystems, and biodiversity.

[70] Odisha ranks fourth amongst the State/Union Territories of the country in terms of area under forest cover, with a total forest area of 58,135 sq. km.[17] The forests are home to a rich floral and faunal diversity of the Similipal biosphere, including rich medicinal plants in the Similipal and Gandhamardan forest ranges. In addition to the rich biodiversity housed by the state's forests, Odisha's wetlands, like Chilka Lake and the mangrove forests of Bhitarkanika, attract large populations of migratory birds.

[71] The districts of Anugul, Debagarh, and Dhenkanal are located in central Odisha and are characterized by fertile plains and gentle hills. These regions support a mix of deciduous and dry forests, providing habitat for various species of flora and fauna. The presence of rivers and water bodies enhances the overall biodiversity in these districts.

[72] Gajapati, Ganjam, and Rayagada districts lie in the southern part of Odisha and feature a diverse landscape encompassing coastal areas, hills, and valleys. The coastal regions are dotted with sandy beaches and mangrove forests, supporting unique marine and avian species. Inland, the Eastern Ghats dominate the landscape, fostering rich biodiversity with diverse plant and animal life.

[73] Kalahandi, Kandhamal, and Nuapada districts are part of the Western Odisha plateau, characterized by hilly terrains and lush forests. These districts are rich in biodiversity, housing a variety of wildlife, including elephants, tigers, leopards, and many species of birds. The Western Odisha plateau also boasts several rivers and waterfalls, adding to the ecological diversity of the region.

[74] The districts of Kendujhar, Malkangiri, Mayurbhanj, and Sundargarh are located in northern and northeastern Odisha, and are primarily known for their forested areas and mineral-rich lands. Kendujhar, in particular, is well-known for the Simlipal National Park, which is a biodiversity hotspot, hosting a significant number of plant and animal species. Malkangiri, with its hilly and forested landscapes, is an essential part of the Eastern Ghats, contributing to the ecological balance of the region.

[75] Unsustainable agricultural practices, an increasing population and the subsequent sprawling urban areas, and aggressive development programmes, including the construction of roads, threaten biodiversity in the state. Current and projected future impacts of climate change are acting as a compounding driver of land degradation and threaten fragile ecosystems and biodiversity in the region. The project intends to work closely with state authorities and the forest department to monitor forest encroachment and limit deforestation.

[76] Tribal communities in the project tend to practice traditional farming methods and rely on forest resources for subsistence. OPELIP Phase I's promotion of organic agricultural practices and mixed farming systems alongside agroforestry have helped protect biodiversity and mitigate weather and biotic risks. Training and advice on optimal livestock practices have also ensured that smallholders are now aware of the carrying capacity of the area where they rear their livestock and do not over-graze pastures.

[77] By implementing SWC/WHSs, the project has improved water availability for wildlife and nature. These measures reduce soil erosion, lessen runoff velocity, improve soil moisture regimes, enhance overall soil health, revive springs, and recharge the groundwater table leading to increased basal flows, which lengthen the period of water availability in streams. These measures mitigate and reduce periods of water scarcity and enhance environmental flows.

c.Water Resources

[78] Despite Odisha’s long coastline (480 KM) and significant freshwater and brackish water resources suitable for pisciculture, the state is dependent on its monsoon for its water resources. Southwest monsoon triggers rainfall in the state and about 78% of total annual rainfall occurs during the period from June to September. The natural recharge of groundwater occurs after percolation from land after rain events. The analysis of annual rainfall reveals a negative trend indicating that the total amount of rainfall received has been decreasing for some parts of the states. Mean annual rainfall for an RCP 4.5 scenario is projected to decrease by - 4.6% to an increase of + 25.7 % in the near term and a decrease of - 8.2 to an increase of + 55.7% towards mid-century in the districts. The uncertainty associated with this variability and the drastic difference across regions implies statewide uncertainty in the availability of water resources and flood control.

[79] Moreover, as per the latest assessment, the state has net dynamic groundwater resources of 16.69 lakh ha.m (BCM), of which 5.2 lakh ha.m (BCM) has been explored. Groundwater is highly vulnerable to the impacts of climate change. Rising temperatures and intermittent dry spells may result in greater heat stress for people and ecosystems, depleting resources because of overuse and high evapotranspiration.

[80] Odisha is well endowed with an extensive network of rivers and streams, which are largely rainfed. Additionally, several coastal wetlands are scattered along the coast including Chilika and Gahirmatha. The Odisha coastline also hosts highly diverse mangrove systems, particularly in the Mahanadi, Brahmani and Baitarani rivers deltas. However, Industrial development – such as the production of steel, chemicals, and fertilizers – is expanding in coastal areas of Odisha and negatively impacting the coastal ecosystem. The Special Economic Region between Paradip and Gopalpur is attracting investments in petrochemicals, steel production and manufacturing, with further development anticipated with the expansion of port facilities. These industrial activities alongside run-off from agricultural lands and wastewater discharge from factories – are causing water pollution that threatens community

livelihoods such as farming and fishing. Beach mining and other industries also harm Odisha's coastline.

[81] Several major rivers flow through these districts, including the Mahanadi, Baitarani, Brahmani, and Rushikulya. These rivers provide vital water resources for agriculture, drinking water supply, and industrial use. Proper management and sustainable use of river water are essential to meet the water demands of the growing population and various economic activities.

[82] Groundwater is an important source of water for both irrigation and domestic purposes in these districts. However, excessive and unregulated extraction of groundwater can lead to depletion of aquifers, causing water scarcity and adverse environmental impacts. Sustainable groundwater management practices, such as rainwater harvesting and aquifer recharge, are crucial to maintain water availability and quality.

[83] Certain districts in Odisha experience water scarcity, especially during the dry season. Effective water resource planning, including watershed management, water conservation, and efficient irrigation practices, can help mitigate the impact of water scarcity. Community participation and involvement are vital for sustainable water resource management. Encouraging local communities to actively participate in water-related decision-making and management can lead to more effective and inclusive water governance.

[84] Situated in forests and forest fringes in high rainfall regions, the programme area has abundant surface water resources with big and small perennial streams fed by local springs. However, due to the hilly terrain there are significant local variations with more water in villages situated in the foothills compared to villages in the steeper slopes and on plateau.

[85] Overall, the sustainable management of water resources in OPELIP districts is critical for ensuring water availability for various needs, supporting agriculture, promoting economic activities, preserving ecological balance, and safeguarding the health and well-being of the population. Integrated water resource management approaches, supported by scientific research and inclusive governance, can play a significant role in addressing water-related challenges in the region.

[86] Data regarding irrigation potential in the programme villages is not available. However, the Mission team came across potential for small diversion based and lift irrigation in most villages visited. The MPAs have implemented small diversion based irrigation projects in some of the villages, especially to provide irrigation during the *kharif* season by diverting rainwater runoff from seasonal and perennial streams by constructing diversion weirs and building earthen or cement concrete channels to the paddy fields. Overall there appear to be opportunities for more such projects and also for lifting water from streams.

d.Climate trends and impacts

[87] Odisha is characterized by a tropical climate with high temperature, high humidity, medium to high rainfall and short and mild winters. Odisha experiences four seasons, winter season from December to February is followed by the pre-monsoon or hot weather season from March to May, June to September has the southwest monsoon season and the period of October and November is the post-monsoon season.

[88] Historical climate trends: Assessment of the historical climate variability and trends in mean climate (maximum temperature, minimum temperature and precipitation) for the implementation districts of Odisha over the period 1951-2018 (68 years), has been made using historical gridded observations from the India Meteorological Department (IMD)[1].

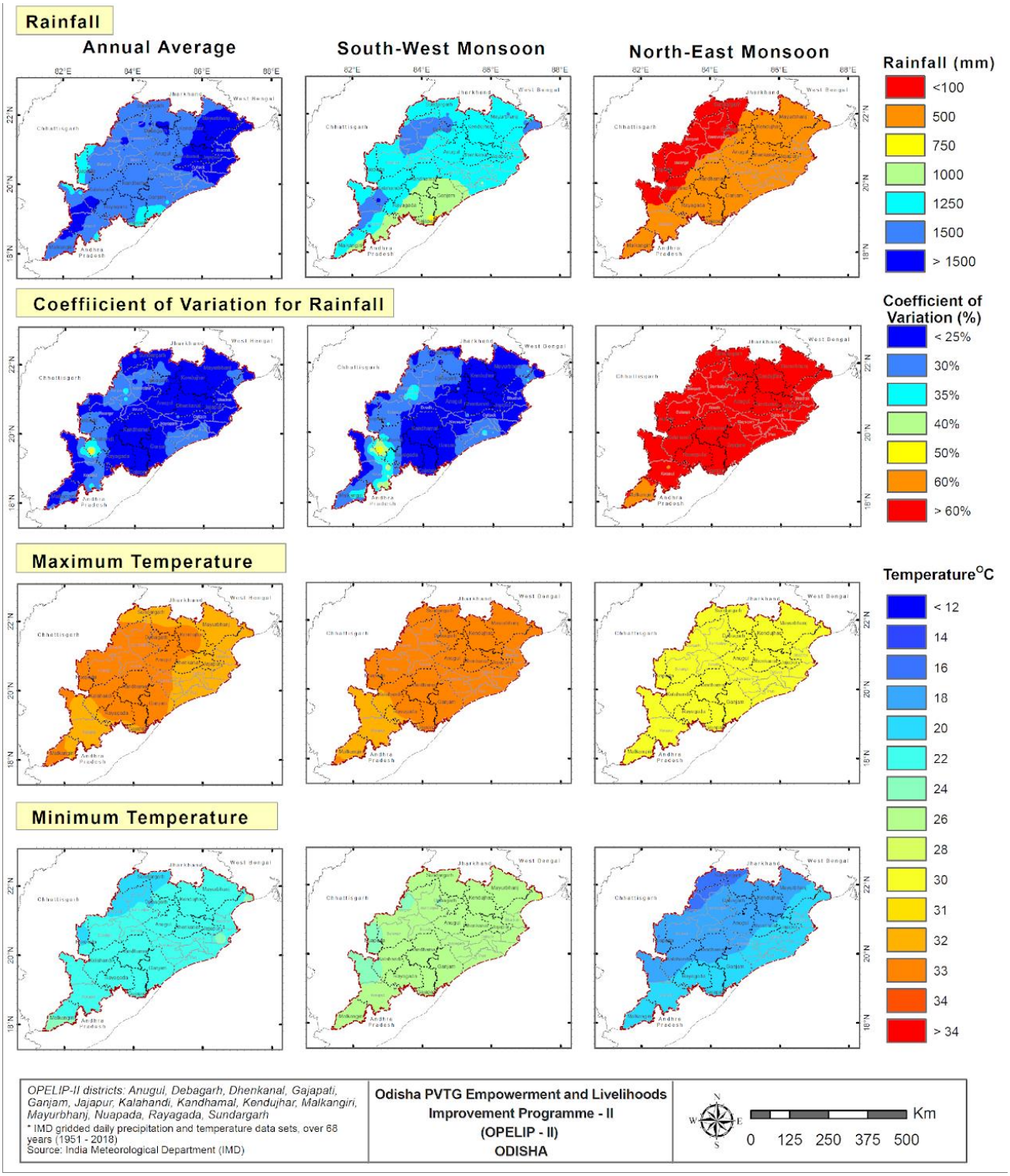
[89] Orography and landuse influence spatial distribution of rainfall and temperature. Human-induced landscapes and human activities play a key role in altering the climate at a local and regional scale. It is important to understand the variation in rainfall as well as temperature since these variations have to be kept in mind while designing appropriate interventions (conservation

[1] www.imd.gov.in/advertisements/20170320_advt_34.pdf.

practices or machineries etc.). Therefore, analysis has been carried out at the district level.

[90] Summary of observed temperature and rainfall trends for the districts is presented. All the analysis and comparisons are based on the data for the 14 OPELIP - II districts (OPELIP-II districts: Anugul, Debagarh, Dhenkanal, Gajapati, Ganjam, Jajapur, Kalahandi, Kandhamal, Kendujhar, Malkangiri, Mayurbhanj, Nuapada, Rayagada, Sundargarh).

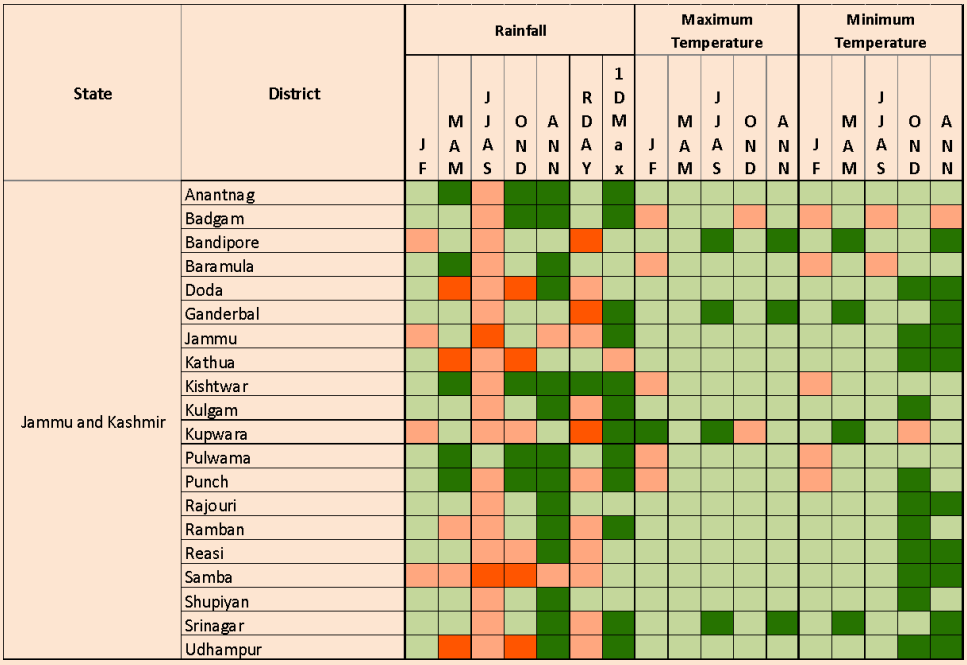
Figure 4. Observed (1951 -2018) Annual & Seasonal Precipitation & Temperature for District in Odisha



[91] Current observed temperature: Mean maximum temperature of Odisha is 32.1°C (30.9 - 33.2°C). Mean minimum temperature is 21.0°C (20.2 - 22.1°C) is observed. Both maximum and minimum temperature peak during the summer season (March to May). For annual maximum temperature the highest value is attained for Nuapada district (32.5°C) falling on south western part while the lowest value is attained for district of Mayurbhanj (31.8°C) on north eastern part. For annual minimum temperature the highest value is attained for Malkangiri district (22.1°C) falling on southern part while the lowest value is attained for district of Sundargarh (19.9°C) on northern part. Increasing trend with high confidence for maximum temperature is observed in all 14 districts. Decreasing trend with low confidence for minimum temperature is observed in all districts except for Malkangiri district (increasing trend with low confidence. Seasonally all seasons show increasing trend (high confidence) in all 14 districts.

[92] Current observed rainfall: Mean annual rainfall observed is 1438 mm (980 – 1905 mm). Nuapada had the lowest (1226 mm) and Mayurbhanj had the highest (1590 mm) rainfall. South west monsoon contributes 78.3% (1126 mm) and 11.4% (164 mm) of annual rainfall contribution comes from pre-monsoon months. All districts show increasing trend in annual rainfall with low confidence except in Nuapada district (decreasing trend with low confidence). However, south west monsoon season shows decreasing trend in rainfall (low confidence) in districts of Kandhamal, Nuapada, and Rayagada. Decrease in number of rainy days (low confidence) is observed in all districts, except in districts of Gajapati, Kandhamal, Kendujhar, and Nuapada (increasing trend with low confidence). Out of 68 years rainfall analysis, districts on an average had 47 years of normal rainfall years, 11 deficient rainfall years and 10 years had excess rainfall years.

Figure 5. Observed Trend in Temperature and Rainfall



Data Source: India Meteorological Department (IMD) gridded temperature and rainfall for the period 1951-2018 (68 years).

JF:Winter, MAM:Summer, JJAS:Monsoon, OND:Post monsoon, ANN:Annual, RDAY:Rainy days, 1DMax:1 day maximum rainfall,

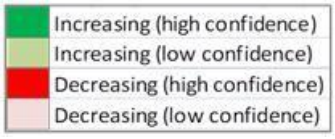
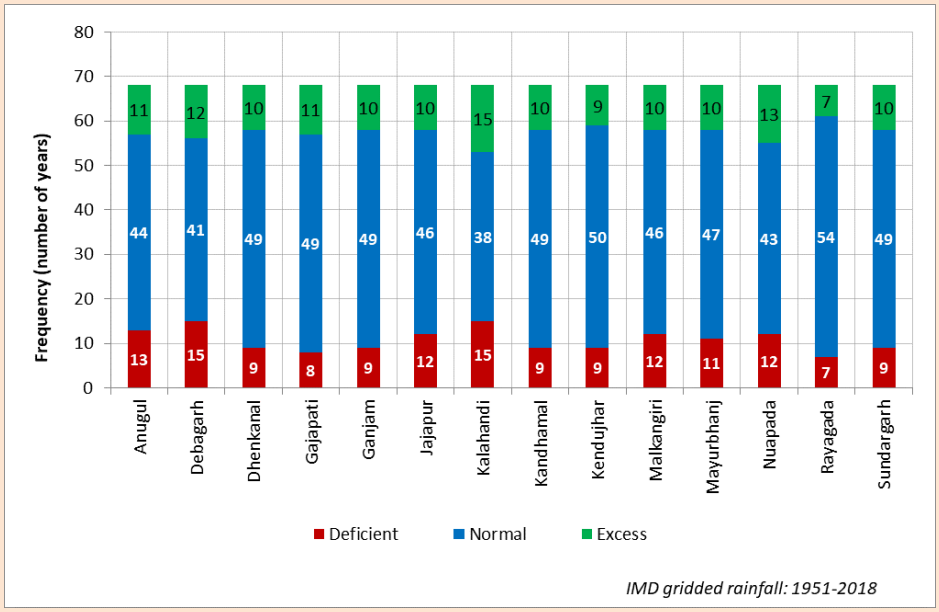


Figure 6. Rainfall Distribution based on f long period average



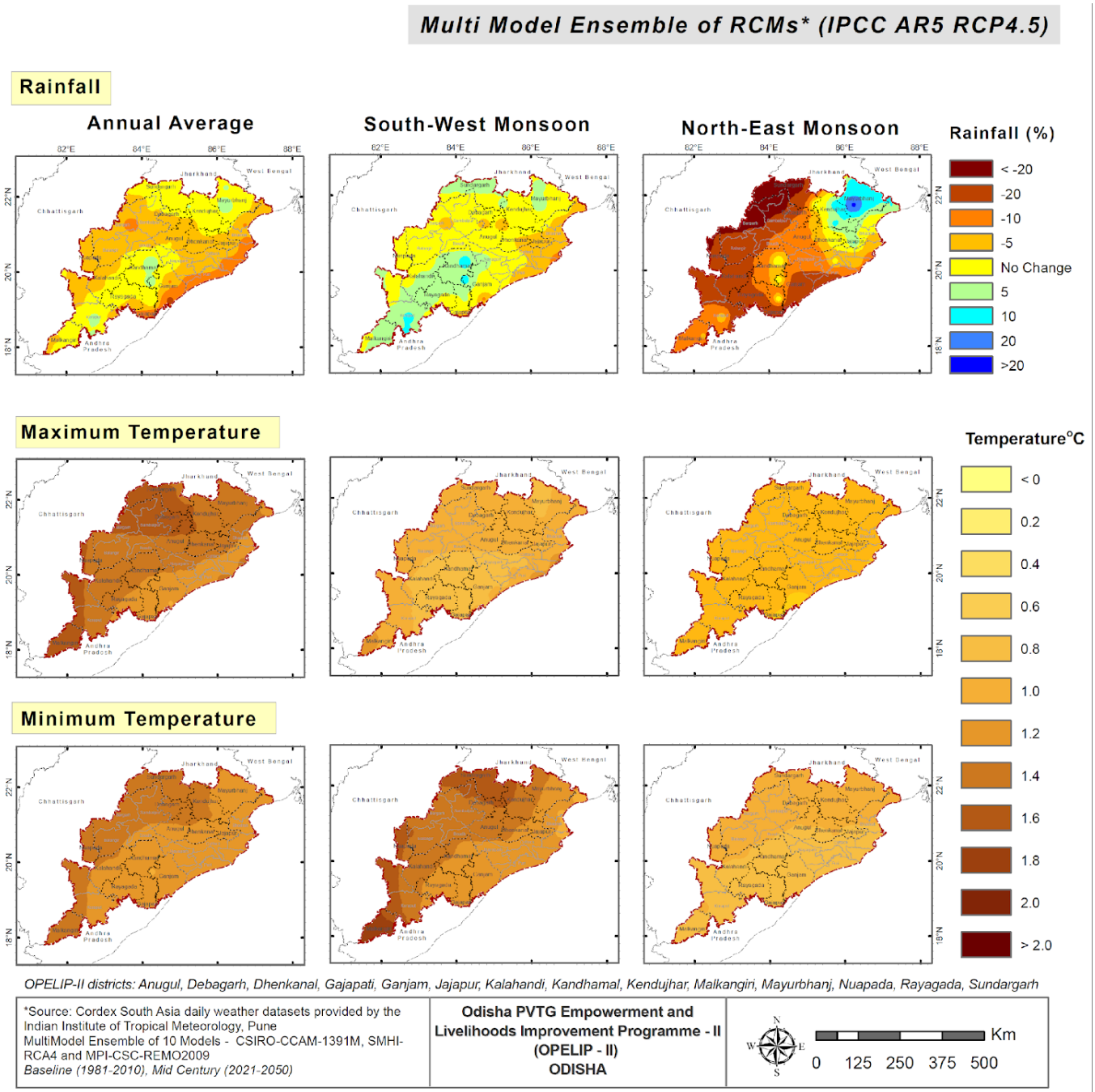
[93] Summary of historical climate trends: In summary the OPELIP – II districts of Odisha historically show increasing trend in maximum(high confidence) and decreasing trend in minimum temperature (low confidence) in all seasons. Increasing trend in south west monsoon season (JJAS) rainfall, decreasing trend in north east monsoon (OND) rainfall, and decreasing trend in rainy days is observed in many districts (low confidence). In the period of 68 years, annual rainfall distribution analysis shows that majority of the districts on an average had 69% normal, 16% deficient and 16% excess rainfall years[2]. Increase in minimum temperature during rabi cropping season may require additional water demand (crop, human and livestock). Districts with increasing trend in temperature and decreasing trend in rainfall would likely to have water stress and drought like situation. Uneven rainfall distribution and extreme events may result in flood.

[94] Projected Climate Change: The CORDEX South Asia modelled climate data on precipitation, maximum temperature, minimum temperature, and climate extremes indices have been analysed for the OPELIP – II districts of Odisha for baseline (BL, 1981-2010) and mid-century (MC, 2021-2050) under two IPCC AR5 emission scenarios namely, RCP4.5 (moderate emission) and RCP8.5 (high emission) scenarios. Ensemble mean of 10 RCMs at a spatial resolution of 50km x 50km has been used. The CORDEX South Asia simulations with the models indicate an all-round warming over all districts. Summary of projected temperature and rainfall for Odisha districts is presented.

[95] Projected Climate: For Odisha state as a whole, maximum temperature is projected to increase by 1.3°C under the IPCC AR5 RCP4.5 scenario while an increase of 1.5°C under the IPCC AR5 RCP8.5 scenario is projected towards mid-century. Similarly, change in minimum temperature is projected to increase by 1.2°C and 1.5°C towards mid-century under IPCC AR5 RCP4.5 and RCP8.5 respectively. The projected increase in maximum temperature is higher than the minimum temperature. The seasonal increase is higher in the summer season (MAM) for both maximum and minimum temperature. Average annual rainfall is projected to decrease marginally by 3% and marginally increase by 2 % under moderate and high emission scenarios respectively towards mid-century as compared to the baseline. The highest decrease is likely in winter season (JF) and pre-monsoon (MAM).

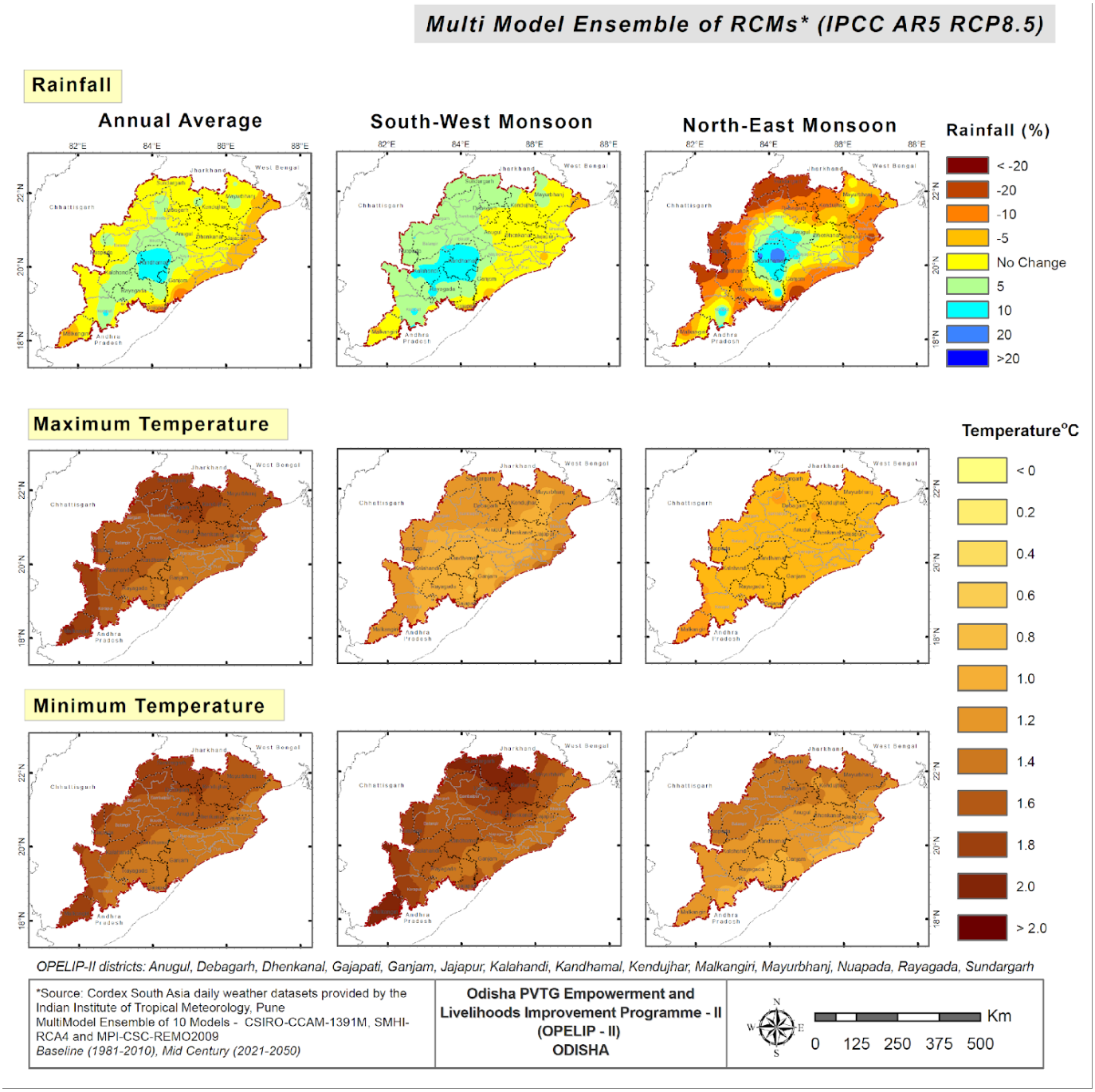
[2] +/-19% Long Period Average (LPA): Normal rainfall year, <-19% to -59% LPA: Deficient rainfall year, >+19% to +59%: Excess rain fall year (http://www.imdpune.gov.in/weather_forecasting/glossary.pdf).

Figure 7. Projected Future Changes in Annual & Seasonal Rainfall & Temperture for Mid-Century (2021-2050) with respect to Baseline (1981-2010) for Districts in Odisha



Projected Climate for OPELIP – II Districts: All 14 districts of the UT are likely to have an increase in maximum and minimum temperatures under IPCC AR5 RCP4.5 and RCP8.5. The projected increase in maximum temperature ranges from 1.1°C (Gajapati and Ganjam) to 1.5°C (Debagarh and Malkangiri) under RCP4.5 and 1.2°C (Gajapati) to 1.8°C (Malkangiri) under RCP8.5 towards mid-century. The projected increase in minimum temperature ranges from 0.7°C (Gajapati, Kalahandi and Rayagada) to 1.0°C (Malkangiri) under RCP4.5 and 1.3°C (Gajapati, Ganjam and Rayagada) to 1.7°C (Malkangiri and Sundargarh) under RCP8.5 towards mid-century. The projected change in annual rainfall is -4.3% (Ganjam) to 2.8% (Kandhamal) under RCP4.5 scenario towards mid-century. -2.6% (Malkangiri) to 8.2% (Kandhamal) increase in rainfall is projected under RCP8.5 scenario. SW monsoon (JJAS) season is projected to have -3.1% % to 4.9% change in rainfall while NE monsoon (OND) season is likely to experience marginal decrease to increase (-23% to 9%) in rainfall under both emission scenarios.

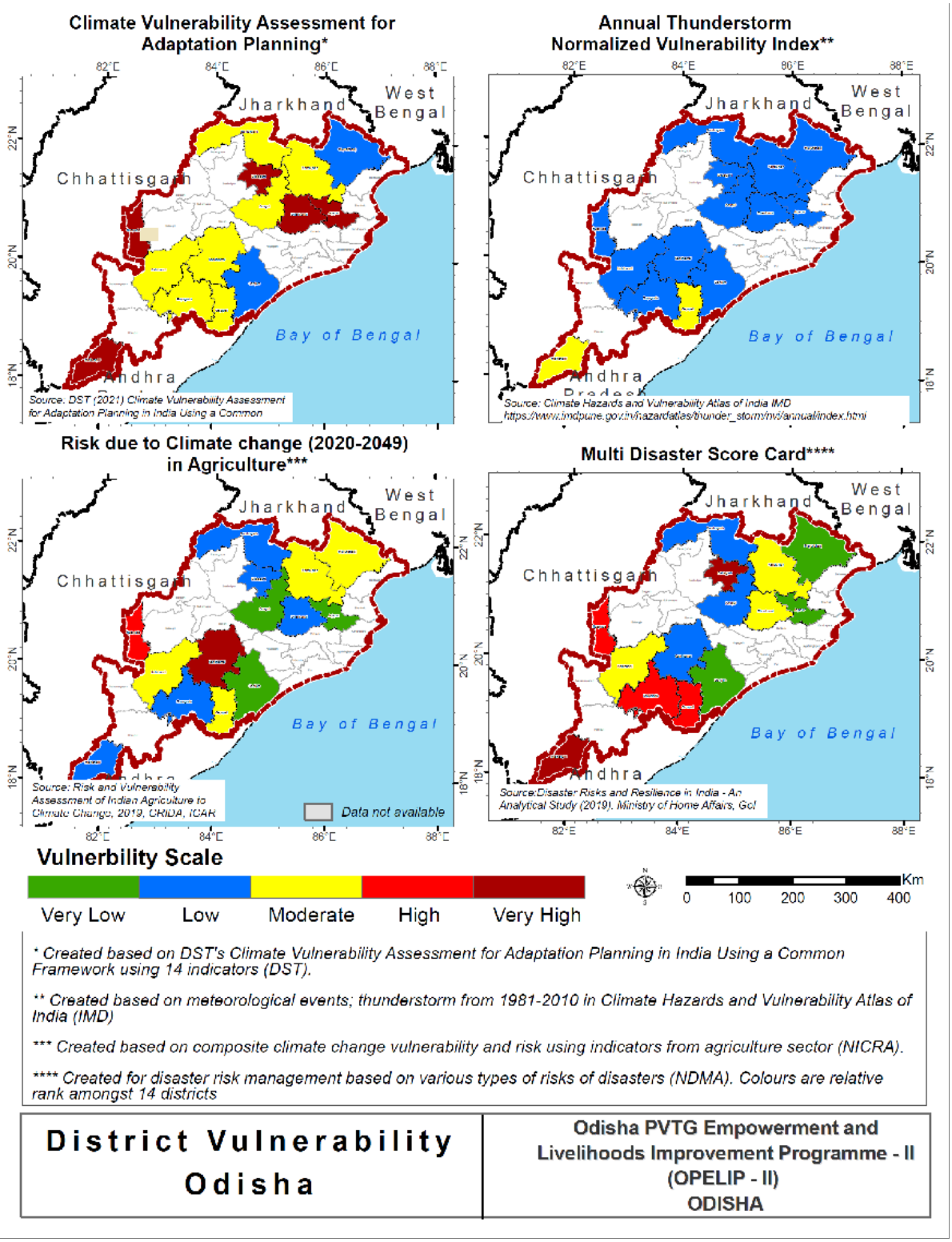
Figure 8. Projected Future Changes in Annual & Seasonal Rainfall & Temperture for Mid-Century (2021-2050) with respect to Baseline (1981-2010) for Districts in Odisha



[96] Climate Extremes: To simplify the communication of the complicated relationships between climate change and its impacts, indices that represent climate extremes are established. Simple climate extremes can be understood from the sums of mean temperature and precipitation. Information on the sensitivity of a system, such as exposure time and threshold levels of event intensity, is factored into more sophisticated climatic extremes indices[3]. Five temperature indices (responsible for crop loss, infrastructure loss, heat stress, reduction in outdoor activity time, forest fire etc.) and five rainfall indices (responsible for drought, flood, erosion, infrastructure loss, etc.) are developed which may influence the project objectives.

[3] http://www.smhi.se/polopoly_fs/1.805!Climate%20indices%20for%20vulnerability%20assessments.pdf.

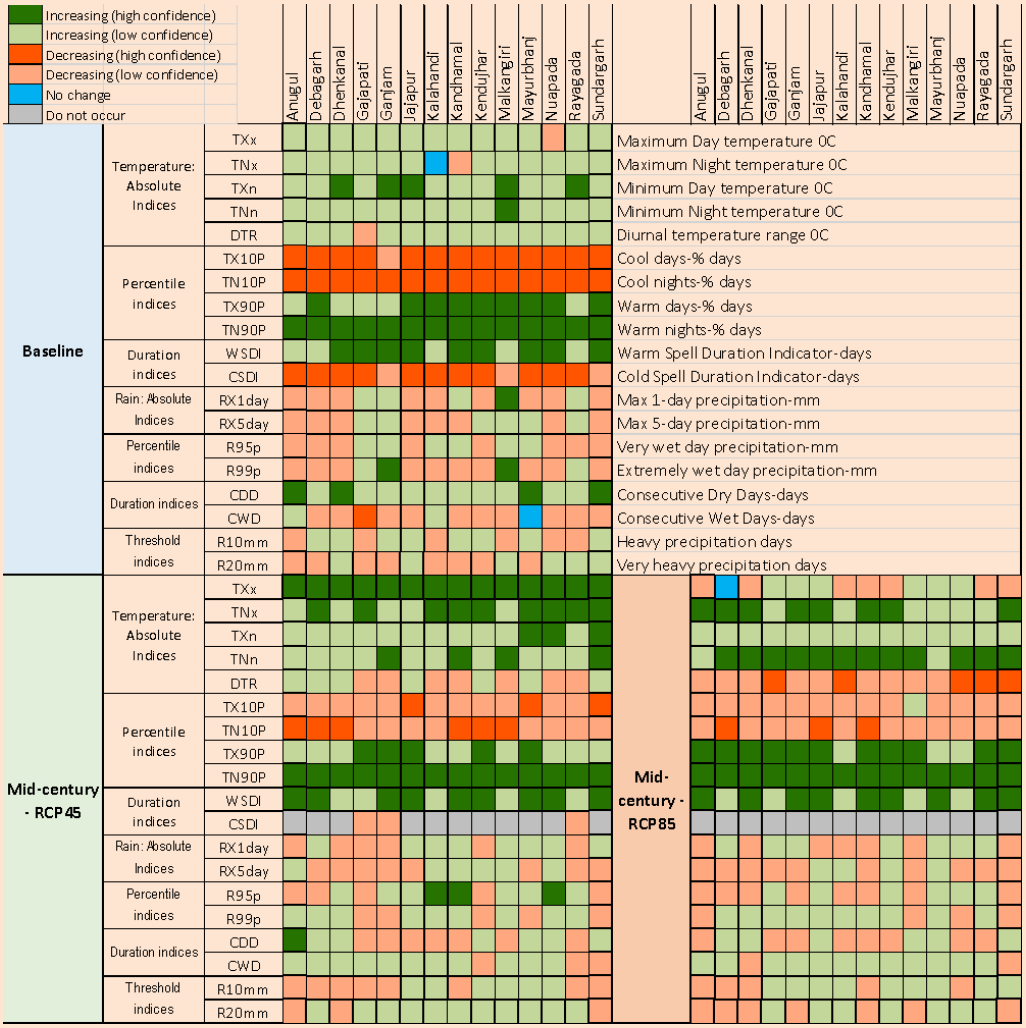
Figure 9. Climate Change Vulnerability of Districts of Odisha from various studies



[97] Temperature Indices: Both emission scenarios project a decline in cool nights (TN10P) and Cool days (TX10P). Warm nights (TN90P) and warm days (TX90P) are expected to increase (with high confidence) across all 14 districts. The diurnal temperature range (DTR: reflects the temperature variation within a day and is defined as the difference between daily maximum and minimum temperatures) is expected to decrease under RCP8.5. Under both scenarios, the warm spell duration indicator (WSDI) is expected to rise (high confidence). The cold spell duration indicator (CSDI) is expected to fall (with low confidence) and may not occur in the future.

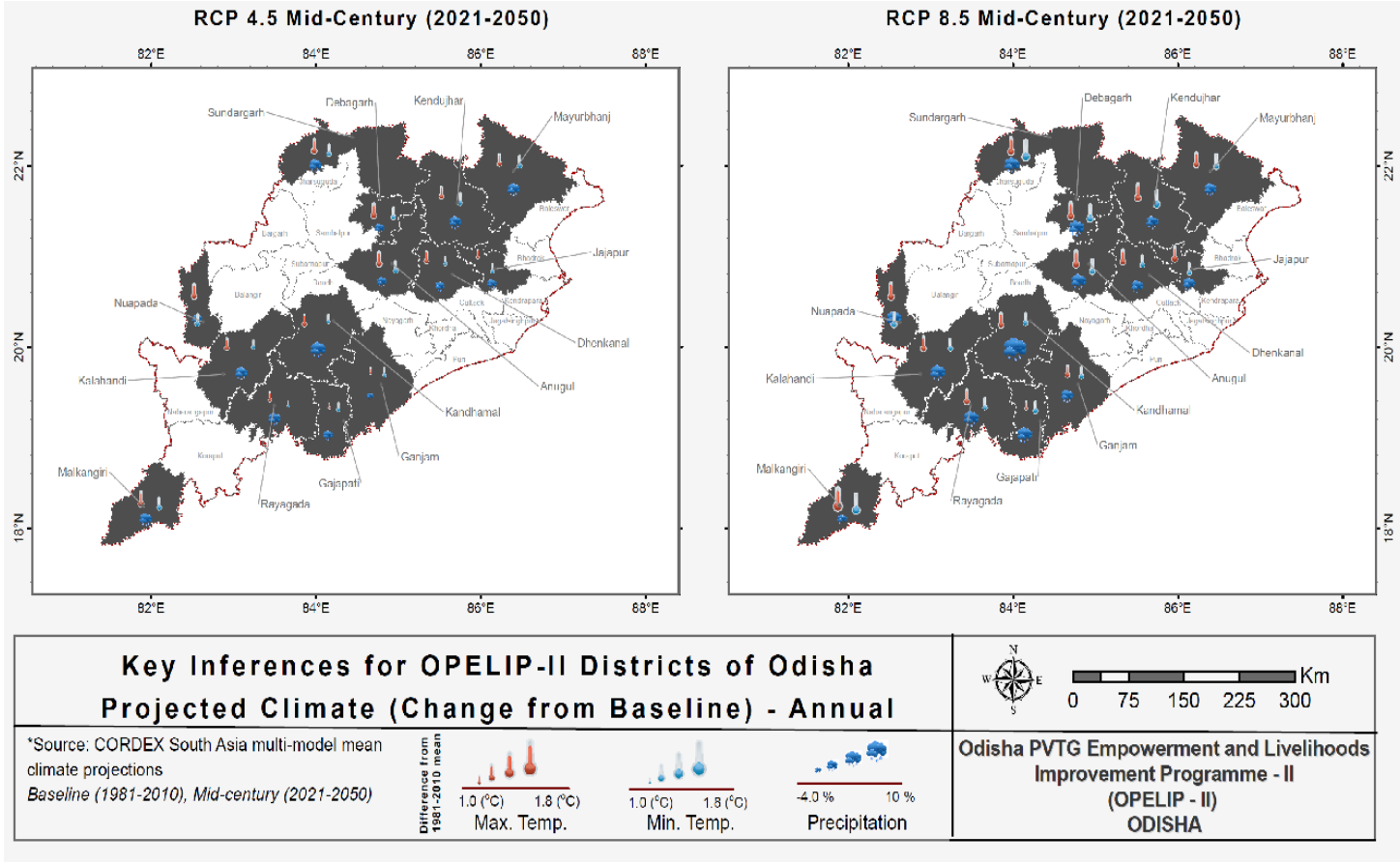
[98] Rainfall Indices: Consecutive dry days (CDD) are projected to increase for 7 districts (Anugul, Debagarh, Dhenkanal, Kendujhar, Mayurbhanj, Nuapada, Sundargarh; with low confidence) and decrease for 7 districts (Ganjam, Jajapur, Kalahandi, Kandhamal, Malkangiri, Rayagada, with low confidence) under RCP4.5 scenario. Under RCP8.5 scenario, 6 districts are likely to experience increase (Debagarh, Dhenkanal, Jajapur, Malkangiri, Mayurbhanj, Sundargarh, low confidence) and decrease in 8 districts (low confidence). The number of consecutive wet days (CWD) is likely to decrease in 3 districts (Kendujhar, Rayagada, Sundargarh, low confidence) and increase in 11 districts (low confidence) under the RCP4.5 scenario. However, under the RCP8.5 scenario, All districts (except Dhenkanal, Sundargarh) are projected to have increasing consecutive wet days (CWD, low confidence). Precipitation on extremely wet days (R99p) is expected to increase (low confidence) in all districts except in Anugul, Malkangiri, Nuapada, and Sundargarhunder RCP8.5, whereas it is expected to decrease in Gajapati, Ganjam, Kendujhar, Mayurbhanj, Sundargarh under RCP4.5. Under RCP8.5, 1 day maximum precipitation (RX1DAY) is projected to increase (low confidence) in Debagarh, Jajapur, Kalahandi, Kandhamal, Malkangiri, Mayurbhanj, Nuapada, Sundargarh, whereas it is expected to decrease under RCP4.5 in Anugul, Dhenkanal, Gajapati, Ganjam, Kendujhar, Rayagada. Wet weather may affect standing crops, cause floods and soil erosion, emergence of pest and diseases.

Figure 10. Trend in Extreme Climate Indices



[99] Heat Stress on Humans and Livestock: Humidex (HI) and temperature-humidity index (THI) are single value depicting the integrated effects of air temperature and humidity associated with the level of heat stress in human beings and animals respectively. Though goats are more tolerant to heat stress than sheep and cows, it is also well known that high temperatures and relative humidity values significantly affect meat yield, quality and composition of small ruminants[4]. Elevated temperature and humidity as presented in THI negatively affects feed intake and altered hormone concentration leading to negatively affecting the productive and reproductive performance of farm animals[5]. . Under the projected climate, THI (Animal heat stress) is likely to increase for all 14 districts with the range of increase from 16% (Jajpur) to 31% (Ganjam, Malkangiri) under RCP8.5 scenarios as compared to the baseline. The peak impact months are May, June and July. Under the projected climate, HI (Human heat stress) is likely to increase for all 14 districts with the range from 27% (Jajpur) to 48% (Rayagada) under RCP8.5 scenarios as compared to the baseline. On an average 32% and 40% increase is likely in all districts under RCP4.5 and RCP8.5 scenarios respectively. Duration of out-door farm activities like agriculture labour are likely to be affected due to many folds increase in projected heat stress. The months of April, May and June are noteworthy due to either extreme heat or humidity

Figure 11. Key Projected Climate Inferences for 14 OPELIP - II Districts of Odisha



[4] Silanikove N. The physiological basis of adaptation in goats to harsh environments. Small Ruminant Research. 2000;35:181-193. DOI: 10.1016/S0921-4488(99)00096-6.

[5] Habeeb AA, Gad AE, Atta MA. Temperature-Humidity Indices as Indicators to Heat Stress of Climatic Conditions with Relation to Production and Reproduction of Farm Animals. Int J Biotechnol Recent Adv. 2018; 1(1): 35-50. doi: 10.18689/ijbr-1000107.

[100] **Summary projected climate:** Projected climate indicate hotter and marginally wetter future for most of the OPELIP - II districts of Odisha. Heat waves are expected to become more common, putting a greater burden on society and the environment. Precipitation is expected to rise slightly to moderately in the future, with much of the increase attributed to heavy downpours. The districts are more at risk due to spatial and temporal heterogeneity. Rising temperatures and changing precipitation patterns could have an effect on available water resources. All districts are projected to see an increase in the warm spell duration indicator (WSDI), and extreme rainfall (1 day and 5 day maximum) is also expected to rise in some of the districts, which is likely to raise the flood risk. Floods and droughts are projected to become more common as the number of consecutive dry days (CDD) and the number of consecutive wet days (CWD) increases. Climate change adaptation policies and resource allocation could be improved by considering regional variations in climate trends.

[101] Smallholder farmers and target groups display a moderate awareness of climate risks and related adaptive and mitigation measures. Project efforts to build the adaptive capacities of its beneficiaries must emphasize the need for disaster risk planning, climate resilient cropping, and reduced post-harvest losses, among other interventions that build the beneficiary's capacity to cope with, or recover from, the effects of climatic shock events.

[102] Climate Impact: With a flood-prone area of 33,400 square kilometers, Odisha is India's fifth most flood-prone state. The state's entire coastline is frequently exposed to heavy rainfall, waterlogging, cyclonic winds, tidal flows, and flooding. These climatic shocks may have a detrimental impact on agriculture in the state. For example, paddy fields in the coastal areas will be increasingly prone to frequent erosion and salinization. Furthermore, because climate projections indicate that drier areas will become drier and flood-prone areas will be subject to more flooding, smallholder farmers will be more prone to losing their harvest. Climate variability may result in increasing challenges associated with the outbreak of pests and diseases. The fisheries sector in Odisha will also be impacted by climate change. The livelihoods of the fishermen will also be affected by sea level rise and erratic rainfall patterns that affect the open reservoirs and ponds/tanks.

[103] According to the Coastal Vulnerability Index (CVI) study by the Indian National Centre for Ocean Information Services (INCOIS), vulnerability, loss and damage from sea level rise, coastal geomorphology, tidal range and elevation in the area of Odisha coastline varied from “low” in about 76 kilometres of the coastal stretch of Odisha state, covering parts of Ganjam, Chilika, southern Puri and Kendrapara and to “medium” in about 297 kilometres, covering northern Ganjam, Chilika, central Puri, Jagatsinghpur, Kendrapara, southern Bhadrak and northern Balasore and to “high” in about 107 kilometres, covering northern Puri, parts of Jagatsinghpur, Kendrapara, Northern & Southern Bhadrak and Southern Balasore.

[104] In Odisha, normal flood damage occurs mainly in areas surrounding the Mahanadi, Brahmani and Baitarani Rivers. These rivers have a common delta where flood waters intermingle and when they are in spate simultaneously, causing considerable damage. This problem becomes even more acute when floods coincide with high tides. The water level rises because of the deposits of silt on the riverbed.

[105] Coastal pollution and erosion caused by inappropriately sited infrastructure are causing degradation of coastal ecosystems including mangroves and seagrasses. These anthropogenic impacts are likely to be compounded by climate impacts in future, including more frequent, larger storm surges caused by intensified cyclonic activity.

[106] Climate change adaptation: The project components are designed to encourage livelihood diversification, enterprise development in response to market signals, and climate adaptation considerations in order to face the problems in the context of climate change. Building the capacity of vulnerable target groups to diversify activities through investments in new varieties, small-scale livestock, and off-farm enterprise growth is a subcomponent of the project. The vulnerable groups (women, the poor, and young people) will become more resilient to hazards associated with climate change as a result of capacity development and training components included in various programs.

e.Climate change mitigation

[107] Emission: The GHG Emission Inventorisation in the state of Odisha was carried out in 2011-12 based on the IPCC Guidelines for National Greenhouse Gas Inventories. The Carbon Footprint study for the Odisha state indicates that the total GHG emissions in the baseline year of 2011-12 were 98.5 million Tons CO2 Eq. In 2011-12, the Energy sector was the largest source of emissions with over 61.3 million Tons of CO2 Eq. Of these emissions, 83% were emitted from power generation, 10% were emitted from transport, 3% from residential/commercial, 1% from other energy and 3% from fugitive emissions. Agriculture sector contributed 25 million Tons of CO2 Eq. emissions. Rice cultivation and enteric fermentation emissions were the largest contributors, collectively amounting to about 77% of emissions from agriculture. Emissions (both direct and indirect) from agricultural soils accounted to another 20%. Emissions generated through manure management and crop residue burning formed a smaller 3% addition to the emissions from agriculture. Emissions from Waste sector amounted to 0.7 million Tons of CO2 Eq. The largest contributor to these emissions was waste generated by industries and accounted for 40% of the total waste emissions. Domestic waste water contributed another 34% while municipal solid waste's share was 26% of the total emissions from waste. Emissions from the Industry sector, which included emissions generated from cement production, chemical industries, iron and steel industries, aluminium industries, ceramic industries, chemical industries, ferro-alloy industries, pulp and paper industries and other industry related energy consumption; amounted to 48.4 million Tons of CO2 Eq. These emissions account for 49% of the total emissions generated in the state of Odisha. Land Use Land Use Change and Forestry (LULUCF); by estimation of carbon stock changes, CO2 emissions and removals and Non-CO2 GHG emission were estimated to be about 37 million Tons of CO2 sequestrated. Total sequestration from Crop Land was estimated to be 7.6 million Tons of CO2 & that from forest land was 28.28 million Tons of CO2. Sequestration from wetlands was relatively small accounting to 1.87million Tons of CO2. Emissions from fuel wood usage and grass land emissions were 2.9 and 0.52 million Tons of CO2 respectively[6].

2.3 Target group profiles

[108] Particularly Vulnerable Tribal Groups (PVTGs) are select tribal communities primarily reliant on forest-based livelihoods, geographically remote, with low levels of human capital and access to services. Out of the 75 PTVGs in India, the eastern state of Odisha in India has the largest number of such groups (13). The Odisha PVTG Empowerment & Livelihoods Improvement Programme (OPELIP-II) aims to reduce poverty and increase food and nutrition security amongst PVTG households in Odisha. The focus of the proposed project will be to deepen the impactful interventions of OPELIP and expand to new villages and households, leveraging lessons learned and best practices from Phase I.

[109] OPELIP II will target 64,208 PVTG households[18] with an estimated total population of 256,832 members, prioritizing vulnerable sub-groups like the landless, women, children under 2, and persons with disabilities. The interventions will be across multiple levels - households, habitation, and village. The project will also cover non-PVTG households (63,345 ST HHs and 57,185 SC & other HH)[19] within the same villages. A total of 184,738 HHs with an estimated population of 738,952 will be covered by the project.

[110] Odisha has a total of 13 Particularly Vulnerable Tribal Groups (PVTGs) that are considered to be the most marginalized and vulnerable among the Scheduled Tribes in the state. Each of these tribes has its unique cultural identity, customs, and challenges.

[111] - The Birhor tribe has a relatively small population scattered across various districts of Odisha, including Sundargarh, Mayurbhanj, Keonjhar, and Angul. The Birhor tribe is a nomadic group, traditionally depending on hunting, gathering, and collecting forest products for their

[6] Estimation of Odisha's Carbon Footprint (2011-12), 2015, http://climatechangecellodisha.org/pdf/Final_Odisha_Carbon_Footprint_Report.pdf

sustenance. They are skilled in traditional knowledge of forest resources, including identifying edible plants and herbs. The Birhor community practices traditional medicine and uses their knowledge of medicinal plants to treat ailments

[112] - The Bonda tribe inhabit the remote hilly regions of Malkangiri district in southern Odisha. The Bonda tribe practices terrace cultivation on the hillsides of Malkangiri district, growing crops like millets, barley, and pulses. They are skilled in horticulture, cultivating vegetables like pumpkin, beans, and gourds in small gardens. Hunting and fishing are essential for supplementing their food resources. They gather a variety of forest produce, including roots, tubers, fruits, and nuts, to meet their nutritional needs

[113] - The Chuktia Bhunjia tribe lives in the hilly regions of Rayagada and Koraput districts of Odisha. The Chuktia Bhunjia tribe practices shifting cultivation, growing crops like millets, maize, and pulses in the hilly areas. They are skilled in making bamboo and leaf-based products for household use and trade. The Chuktia Bhunjia community relies on hunting and gathering during non-agricultural seasons.

[114] - The Didayi tribe primarily resides in the Koraput district of Odisha. They practice shifting cultivation and have their own distinct language and cultural practices. The Didayi tribe practices shifting cultivation (jhum cultivation). They grow crops like rice, millets, maize, and beans. Hunting and fishing are integral to their traditional lifestyle, providing additional protein to their diet. They are skilled in making handicrafts and bamboo crafts, which they sell or barter for other necessities.

[115] - The Dongria Kondh tribe inhabits the Niyamgiri hills in Rayagada and Kalahandi districts of Odisha. The Dongria Kondh community practices hillside agriculture, growing crops like millets, maize, and pulses on the slopes of Niyamgiri hills. They rear livestock such as cows, buffaloes, and goats for milk, meat, and trade. Dongria Kondh are adept at harvesting forest produce like wild fruits, herbs, and medicinal plants. Handicrafts, such as making bamboo and leaf-based products, play a role in their livelihoods.The Dongria Kondh community has faced challenges due to displacement caused by development projects and loss of their traditional lands.

[116] - The Hill Kharia tribe resides in the hilly regions of Mayurbhanj district in northern Odisha. The Hill Kharia tribe practices shifting cultivation, growing crops like millets, maize, and pulses in the forested areas. They are skilled in traditional iron smelting and pottery, producing metal tools, and utensils for their use and trade. The Hill Kharia community is known for their unique hunting practices using bows and arrows.

[117] - The Juang tribe mainly inhabits the Keonjhar and Anugul districts of Odisha. The Juang tribe practices shifting cultivation, growing crops like rice, millets, and pulses in the hills and forest areas. They are skilled blacksmiths, producing iron tools and implements for their use and trade. Hunting and gathering wild foods, including tubers, roots, and fruits, are an integral part of their livelihoods.

[118] - The Kutia Kondh tribe resides in the remote hilly regions of Kandhamal district in Odisha. They practice traditional agriculture. The Kutia Kondh tribe practices shifting cultivation, growing crops like millets, maize, and pulses in the hilly areas. They are skilled in making bamboo and leaf-based products, which they use for household purposes and trade. The community practices hunting and gathering to supplement their food resources.

[119] - The Lanjia Saora tribe lives in the hilly regions of Gajapati district in southern Odisha. The Langia Saora tribe practices agriculture, growing crops like millets, maize, and pulses in the uplands.They have expertise in making pottery and weaving bamboo baskets, which they sell or exchange for essential commodities. The Langia Saora community relies on hunting and gathering for non-agricultural seasons.

[120] - The Lodha tribe primarily inhabits the Keonjhar and Mayurbhanj districts of Odisha. They primarily inhabit the hilly and forested regions of these districts. Traditionally, the Lodha tribe has been a semi-nomadic community that relied on hunting, gathering, and shifting agriculture. However, with changing times, many Lodha people have transitioned to settled agricultural practices and some engage in other economic activities like labor work.

[121] - The Mankidia tribe resides in the Simlipal National Park and Mayurbhanj district of Odisha. They are known for their skill in collecting and selling honey. The Mankidia tribe primarily depends on collecting and trading medicinal plants found in the forests as a significant livelihood activity. They also engage in hunting for wild animals and gathering forest produce like fruits, tubers, and roots. The Mankidia community practices shifting cultivation, growing crops like millets and pulses in the hilly regions.

[122] - The Paudi Bhuyan tribe inhabits the forests of Kandhamal district in Odisha. The Paudi Bhuyan tribe practices traditional agriculture, growing crops like millets, pulses, and oilseeds in the uplands. They engage in fishing, hunting, and gathering forest products like honey, wild fruits, and herbs. Paudi Bhuyan tribe has expertise in making handicrafts like bamboo products and leaf plates, which they use for household purposes and trade.

[123] - The Saora tribe mainly resides in the Ganjam district of Odisha. The Saora tribe practices traditional agriculture, growing crops like millets, pulses, and oilseeds in the upland regions. They engage in animal husbandry, rearing cattle, goats, and poultry for milk, meat, and income. The Saora community gathers forest produce like honey, wild fruits, and tubers.

3. Institutional analysis

a) Institutions

[124] OPELIP II will leverage utilize the existing organisational setup of OPELIP. At the national level:The Department of Economic Affairs, Ministry of Finance, GoI will be the nodal agency for this Project. The Ministry of Tribal Affairs, GoI, will provide overall policy guidance.

[125] At the state level: the Scheduled Tribes and Scheduled Castes Development Department (STSCDD), Government of Odisha, will be the Lead Implementing Agency responsible for the functions relating to planning, funds flow, monitoring, evaluation and other day-to- day management of the project through the PMU.

[126] The Governance system of the existing project will continue with the existing Programme Steering Committee (PSC) chaired by the Chief Secretary with Commissioner cum Secretary STSCDD as the member secretary with other members from key line departments like Agriculture, FARD, and Finance Department.

[127] Micro-Project Agency (MPAs) and Grassroots level implementation: The project will continue to utilise the capacity of existing systems, especially the MPAs, with the support of FNGOs to carry out last-mile workers' responsibilities considering the remoteness of the villages. Key line Departments: Agriculture, Irrigation and Fisheries and Animal Resources Development Department; FRA and Revenue Land Department; Odisha Livelihood Mission.

b) National policies, strategies and regulatory frameworks:

[128] From the perspective of the project's objectives, safeguards and IFAD mainstreaming, the country has the following regulatory and policy framework in place:

[129] National Environment Policy, 2006: Overall guidance on environment management.

[130] The Environmental (Protection) Act, 1986: Overall protection of environment under which number of legislations enacted.

[131] Indian Forest Act 1927: This is an act to consolidate the law relating to forests, the transit of forest-produce and the duty leviable on timber and other forest-produce.

[132] National Disaster Management Act, 2005: An Act to provide for the effective management of disasters and for matters connected therewith or incidental thereto.

[133] The Biological Diversity Act 2002: An Act to provide for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits.

[134] National Building Code (NBC) of India 2005: The code provides regulations for building

construction by departments, municipal administrations, and public bodies. It lays down a set of minimum provisions to protect the safety of the public regarding structural sufficiency, fire hazards and health aspects.

[135] Schedule Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) act, 2006: This act recognizes and vests the forest rights and occupation in forest land in forest dwelling Scheduled Tribes and other forest dwellers who have been residing in such forests for generations but whose rights could not be recorded; to provide for a framework for recording the forest rights so vested and the nature of evidence required for such recognition and vesting in respect of forest land.

[136] The Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Act, 1989: The act places provisions to prevent offences against Scheduled Castes and Scheduled Tribes.

[137] National Commission for Women Act, 1990: The act establishes a body to support and examine all matters relating to the safeguards provided for women under the Constitution and other laws, call for studies or investigations on specific issues, participate and advise on planning processed for socio-economic development etc.

[138] National Policy for Women, 2016: The policy articulates various mandates for the holistic empowerment of women in the country. It includes various areas such as health, education, livelihoods, access to social protection, and protection from violence and discrimination.

[139] State Policy for Girls and Women, 2014: The policy seeks to create an enabling environment for girls and women to have equal opportunities, eliminate discrimination, and build capacities.

[140] Odisha Rights of Persons with Disabilities Act, 2016: The act seeks to facilitate a conducive social environment for persons with disabilities by enhancing inclusion and accessibility parameters across departments and agencies.

[141] Odisha Rights of Persons with Disabilities Rules, 2018 The rule provides guidance on creating a conducive social environment for persons with disabilities

[142] Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (FRA): This act recognizes the rights of forest-dwelling communities, including Scheduled Tribes, to their ancestral lands and forest resources, empowering them for sustainable forest management.

[143] National Environment Policy, 2006: This policy provides a framework for the sustainable management of natural resources, including land, water, forests, and minerals. It emphasizes conservation, protection, and judicious utilization of resources while considering ecological balance and environmental sustainability.

[144] National Water Policy, 2012: This policy outlines the principles and strategies for water resource management in the country, emphasizing equitable distribution, sustainable use of water, and community participation in water governance.

[145] National Policy for Farmers, 2007: While not specific to Odisha, this policy provides guidelines for sustainable development in agriculture, including natural resource management.

[146] National Forest Policy, 1988: This policy emphasizes the conservation, protection, and sustainable use of forest resources to meet the environmental, social, and economic needs of present and future generations.

[147] National Biodiversity Action Plan (NBAP), 2008: This plan aims to conserve and manage the rich biodiversity of the country, including in states like Odisha, through various measures such as habitat restoration, biodiversity assessment, and community participation.

[148] Odisha PVTG Conservation and Development Plan: This plan aims to address the specific needs and challenges faced by PVTG communities in the state. It focuses on improving their socio-economic conditions, health, education, and preserving their unique cultural identity.

[149] Odisha State Tribal Policy: This policy aims to ensure the overall development and welfare of tribal communities, including PVTGs. It focuses on promoting inclusive growth, providing access to basic services, and preserving tribal culture and heritage.

4. Environmental and social category

[150] The proposed environmental and social category for OPELIP II project is **substantial**, based on the SECAP screening tool. The rating has been revised after the field mission by the SECAP / climate specialists in late July 2023. The project covers a large geographic area and the size of the population affected by project interventions is substantial.

[151] **Biodiversity risks** has been assessed substantial during design, mainly because of inherent risks specific to this region that are outside of project control, specially in the case of convergence schemes that will have to be closely monitored during design. Project areas include, or share a boundary with restricted areas, forest areas, and biodiversity-sensitive ecosystems,the project will have zero forest encroachment and deforestation strategy, the Project will not impact on any sensitive areas or result in loss of natural habitat and biodiversity. The project will not involve inputs of fertilizers and other chemical products. Good Agricultural Practices (GAP) – in line with Climate resilient agriculture practices - will be promoted for vegetable production and other specific crops.

[152] However, since the project area is primarily rainfed, crop production may be impacted by seasonal changes and unpredictable precipitation (changing the start and end of the rainy season, intense rainfall, reduced or extended rainy period, intermittent long gaps in the rainy season, etc.). Steep topographical feature is likely to be adversely affected during extreme rainfall leading to landslide/soil erosion. Closeness/proximity to protected areas/wild life sanctuaries (man-animal conflicts), dense forest cover may also impose constraints to project interventions and this may need to be appropriately designed and mitigated against to circumvent the severity of these impacts.

[153] **Resource Efficiency and Pollution Prevention**: the risk has been lowered as the project will promote only organic and natural inputs. In order to improve drinking water facilities and irrigation in remote communities a run-off river schemes has been implemented. The run-off river scheme comprises a temporary bund/ diversion structure/ intake chamber/ inlet across the water course to divert and convey a part of water of the stream (around 5-10% depending up on the discharge and requirement) under gravity through buried pipe line and distribution out lets. The downstream flow pattern is not changed as a minimal part of the water from stream is diverted to outlet. The downstream villager's dependent on the same flow is getting the benefit and not deprived of the stream flow as total water is not stored by constructing big masonry check dam.

[154] **Cultural Heritage risks** have been reassessed low, given the participatory approaches the project will carry and the practices observed in the field, where PVTG and tribal communities participated in the decision making of infrastructure that could have any impact to sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture, OPELIP shall rely on FPIC and will not allow any activity with adverse impact in cultural heritage.

[155] **Indigenous Peoples**: The risk has been reassesed as substantial as the project builds on the experience engaging the PVTGs and tribal communities in Odisha, it is being designed including (i) secure ownership of and access to lands and territories by tribal groups; (ii) strengthen their institutions; (iii) ensure free, prior and informed consent (FPIC); (iv) value tribal knowledge systems (v) promoting the nutritional benefits of traditional food and practices via project activities. The project will be nutrition sensitive and prioritize tribal groups. The free, prior and informed consent (FPIC) implementation plan will be part of the design and given that the totality of targeted population belongs to tribal groups, the Indigenous Peoples Plan will not be a stand-alone document but integral part of project design as component 1, *Community Empowerment and Institutional Strengthening* ensures FPIC processes will be carried out enhancing partnerships between tribal communities and government institutions enabling dialogue and recognition.

[156] **Labour and Working Conditions**: project will promote and use technologies and practices that do not pose occupational safety and health risks i.e. dangerous machinery and tools; hazardous chemicals; toxic or allergenic agents; carcinogenic substances or agents;

parasitic diseases; transmissible animal diseases; confined spaces; ergonomic hazards. Discriminatory practices, high gender inequality and the lack of equal opportunities, denial of freedom of association and collective bargaining have been assessed and the project will promote better working conditions for PVTGs.

[157] **Community Health, Safety and Security**: the project is nutrition sensitive and has done a careful nutritional analysis. OPELIP I worked in water management provided support to PVTG communities to lower risk of water borne deseases. Impacts on ecosystems and ecosystem services relevant to communities' health as well as gender-based violence, including sexual harassment, exploitation and abuse, as a result of labour influx, land redistribution, or other actions that alter community dynamic have been assessed and the project trough its participatory approaches will actively seek to avoid any of those risks.

[158] No resettlement will be implemented by the project. Run-off river schemes are based on socio-environment, economic and technical feasibility study which evidence that there will be no submergence affecting the villages settled on the upstream of reservoir area. Hence, there is no issue regarding rehabilitation and resettlement while implementing DBI schemes

5. Climate risk category

[159] The preliminary SECAP rating was determined to be Substantial, and a second screening after first design team visits now stands at **moderate**. The rating will be reviewed and revised after field visits by the SECAP / climate specialists in late July 2023. The climate risk screening is composed by the following steps: i) Hazard identification; ii) Exposure Assessment; iii) Sensitivity Assessment; iv) Adaptive Capacity and Climate Resilience.

[160] The main climate change-related impacts in the project area are associated with:
(i) Changes in temperature (CMIP5 climate projection of 1.9°C temperature increase according to RCP 8.5 for 2040-2059 timeline period and 3°C temperature increase for the period 2060 -2079) - increased maximum and minimum temperatures, particularly in the summer, and the effect of heat stress on agricultural and livestock productivity;
(ii) Future precipitation changes (-4% to +8% change comparing with the 1986- 2005 baseline) and uncertainty in precipitation distribution (duration, intensity, frequency of extreme wet or dry events – particularly during the monsoon), and effect on water availability to PVTG households – including drinking water and limitations on number of agricultural seasons. The analysis found an increased trend in annual rainfall and a decreasing trend in annual number of rainy days;
(iii) New incidences of weather-related disasters such as hailstorms, wildfires, landslides in hilly regions, livestock diseases and pests. Out of the 14 districts targeted for OPELIP-II, 2 districts (Dhenkanal, Jajpur) are vulnerable to flooding and 2 districts (Ganjam, Gajapati, Keonjhar, Mayurbanj) are currently vulnerable to wind and cyclone.

[161] Due to the increasing climate change dynamic and its negative impact in the project area (depletion of soil nutrients, soil erosion and landslides, floods and increase in pest and disease) there is a need to integrate Climate Smart Agriculture (CSA) as well as Good Agriculture Practices (GAP) that can strengthen local livelihood and improve sustainable agriculture. In addition, water and soil conservation measures, rainwater harvesting, appropriate crop selection, sustainable harvesting and improved processing of NTFP, community-based disaster management system may also be proposed as mitigation measures.

[162] Smallholder farmers and target groups display a moderate awareness of climate risks and related adaptive and mitigation measures. Project efforts to build the adaptive capacities of its beneficiaries must emphasize the need for disaster risk planning, climate resilient cropping, and reduced post-harvest losses, among other interventions that build the beneficiary's capacity to cope with, or recover from, the effects of climatic shock events.

6. Recommendations for project design and implementation

Component 1: Community Empowerment and Institutional Strengthening

[163] The VDAs have the potential to enhance the participation of women, youth, vulnerable groups in the decision-making mechanisms. The project should include professionals (social inclusion officer) to address the cross-cutting issues of gender, youth and vulnerable groups among the PVTG, ST and SC. It will be important that these processes are done in a culturally sensitive manner raising awareness in the communities. It can lead to the construction of a gender and youth strategy that will seek affirmative actions based on comprehensive training processes for women and youth, as well as differentiated access to services and investments to improve their productive systems (related to component 3).

[164] OPELIP II will promote community engagement by leveraging existing community structures and tribal governance and creating Village Development Associations (VDAs). The process will involve the active participation of community members in the preparation of Village Development Plans (VDP), in this process, the participation of women and youth will be enhanced.

[165] The use of the PRA and GALS (Gender Action Learning System) vision planning tool will be key in the engagement of women and youth, enhancing their participation and recognizing their roles in the community.

[166] The service provider/ trained consultant hired to assist in the development of the Village Development Plans/ or the engaged project staff at different level (Field) will pay specific attention to listening to women and youth and promoting their participation.

[167] The progress and performance of the service provider / consultant will be monitored by the Project Management Unit (PMU)/Micro Project Agency (MPA) staff also considering social inclusion aspects.

[168] A minimum representation of 60% for PVTGs and 50% for women in the Village Development Committees (VDCs) and ensure representation in sub-committees. Social inclusion Community Resource Persons (CRPs) based at each VDA to ensure the sustainable operation of the VDAs and VDCs and will implement the targeting, gender and social inclusion strategy.

[169] An FPIC and awareness campaign on tribal rights will be implemented by an experienced service provider

[170] The project will include a training on gender and social inclusion which will address: i) basic concepts; ii) rights, interculturality, gender, social inclusion, intersectionality and protocols for dealing with violence, child labour, emergency plan; iii) economic value of productive and reproductive work, among others.

[171] Village Development Plans (VDC) should incorporate as well i) a brief Climate Vulnerability Assessment ii) the identification of local resilient climate practices implemented by the communities. In addition, Climate Risk Disaster Management Plan could be further improved at the village with the support of FNGO and the Odisha State Disaster Management Authority.

[172] In order to strengthen community empowerment and facilitation of exchange it is adviced to collaborate with researchers who speak the language of the communities. The Kalinga Institute of Social Sciences, based in Bhubaneswar could support to strengthen the process. The institute counts more than 200 PhD students who are originally from the PVTG communities and speak local languages. The synergies between OPELIP II project and Kalinga Insitute could therefore further reinforce the community empowerment process.

[173] On the upgrading/building of key social infrastructure it will be important that the project prioritizes climate resilient infrastructure taking into consideration the climate vulnerability of the targeted area. Furthermore, the participation of women, youth, PVTGs in the decision making of the infrastructure will be essential and Free, prior and informed consent needs to be sought.

The project should also take the opportunity to contribute to the reduction of greenhouse gas emissions by investing in solar-powered infrastructure where feasible and cost-effective.

Component 2: Natural Resource Management and Nutrition security

[174] As a nutrition sensitive project staff with specific nutrition TORs should be included. This staff can also sensitize and train the technical and administrative team on social issues and nutrition on a regular basis. The professional who supports Food Security and Nutrition issues should lead the construction of a strategy that seeks processes and actions for nutritional education for beneficiary families, with emphasis on women and that values the local gastronomic food heritage of the communities according to the nutritional value of local foods as well as awareness campaigns for consumers about healthy food. The natural resource management activities should leverage on local traditional knowledge and learn from sustainable practices.

[175] Gender nutrition sensitive interventions will be promoted under OPELIP-II to ensure that women vision regarding key focus on IPs women, labour conditions, and economic opportunities are supported throughout the project interventions. Diversified food production, food safety at production, post-harvest and processing stages and consumer awareness on food safety and certification schemes are key areas where the project has potential added value in relation with nutrition.

[176] Intergenerational transfer of knowledge should be prioritized for sustainability, the project can encourage dialogues and spaces of knowledge sharing among the elders (who are often seen as the holders of traditional knowledge) and the young people. Current solutions put in place by the communities should be prioritized[20] and the role of women in natural resource management and nutrition should be supported.

[177] The use of resources like the study[21] on Indigenous Knowledge system, commissioned by the Scheduled Caste and Scheduled Tribe Research and Training Institute (Government of Odisha) should be promoted. Such resources can help understand traditional knowledge system on local flora and fauna among the tribal communities considering collection, preservation and consumption patterns and its availability across different seasons as well as the socio-cultural and economic relevance. The blending of scientific knowledge with local traditional knowledge has to be done in recognition of the value that both of them bring to societies. Land titling activities should consider the vulnerable groups and facilitate their access and benefits.

[178] Based on OPELIP experience, the proposed project plans to intensify the village level activities using the Participatory Learning and Action (PLA) approach, to better understand the tribal food systems and promote healthy nutrition behaviours to improve the diets of adolescent girls, women and children while enhancing local biodiversity.

[179] The platform of women SHGs will be leveraged in all the 1,138 villages to deliver focused modules on women empowerment, nutrition and WASH using a digital approach, facilitated by a trained village level nutrition workers.

[180] In addition, specific content will be developed to strengthen engagement with men and other decisionmakers in the village to create enabling conditions for women empowerment and prioritizing nutrition of adolescent girls, women and children.

[181] The Matru Shishu Poshan Kendras (community-based creches) for children 6 months to 3 years; and Spot Feeding activities for pregnant/ nursing mothers and children 3 to 6 years will be continued in selected villages that are nutritionally vulnerable and remote. These interventions have shown impact over the last few years in OPELIP and thousands of children and women have directly benefitted as a result of these interventions delivered by the members of the PVTG SHG.

[182] The project will strive to avoid neglecting the tribal food heritage and will create significant awareness amongst the villages, especially women and youth groups on their nutrition and health related entitlements; and would also work with other departments to ensure

that the PVTG hamlets are reflected in their service delivery plans.

Component 3: Livelihood Promotion

[183] This component will provide opportunities for income diversification which will increase resilience to weather-related shocks and dependence on a single source of income. It is essential to ensure that the component supports climate adaptation and do not lead to overexploitation of resources. Attention will need to be paid to the sustainable use of forest resources, particularly in relation to livestock improvement and other production activities. The project should also consider solar-powered infrastructure where feasible and cost-effective for any relevant activity related to processing. This component can be strategic to include strategies to benefit persons with disabilities according with their own aspirations.

[184] Farmer Field Schools (FFS) approach by a dedicated Technical Service Agency engaged by the project will ensure the inclusion of women.

[185] The project will hire a Technical Service Provider that specializes in natural farming and FFS approach and who will value and seek opportunities to blend tribal knowledge into the capacity development.

[186] Produce from these system will be organic/naturally grown and free from harmful chemicals. Natural farming, based as it is on locally available resources fosters sustainability and independence of production groups. Both these factors are important for a successful exit plan. Opportunities to value and blend tribal knowledge will be sought.

[187] Women often have a crucial role in livestock rearing activities as they are responsible for the day-to-day care and management of animals, including feeding, milking, and cleaning of livestock shelters. The project will ensure women benefit from their work by engaging men and women in visioning exercises (linked in component 1, to address these challenges)

[188] Women's involvement in livestock is deeply ingrained in the traditional knowledge and practices. Livestock also hold cultural significance in PVTG communities. They are often used in traditional rituals, ceremonies, and festivals, where women may play specific roles related to the well-being of the animals and the community.

[189] Integrating nutritional needs of PVTGs into the crop diversification initiative to improve the health and well-being of the PVTG community, seeing them not only on their potential to market but also as consumers so that this activities can contribute to building a sustainable and resilient food system that is connected to their cultural heritage, traditions, consumption patterns and generates profits.

[190] VDA will endorse the decisions of agricultural and livestock intensification, considering that they will use common resources such as water, forest products, this is part of Free, prior and informed consent.

[191] Project will highlight the unique qualities and cultural significance of indigenous products to create niche markets and increase their demand. This will involve branding, marketing, and promotional activities to position tribal products.

[192] The approach focuses on enabling AICs to serve as local input and output aggregators for products surplus oriented to the market. Women participation in the AICs will be enhanced.

[193] The project will also play a role on development and promotion of niche markets and indigenous foods, leveraging their unique selling proposition with health benefits taping on the tribal knowledge, where specially women hold a protagonist role.

[194] The business advisory services and skill development training will contribute to enhance entrepreneurial capabilities and strengthen the business acumen of SHGs and individual entrepreneurs' youth and women. The co-investment model should ensure shared responsibility and ownership, contributing to long-term success and economic empowerment and will be flexible for the case of youth who demonstrate interest and are not able to pay initially but in-kind contribution will be still required.

[195] The project aims to establish an Ajeevika Kendra (Incubation Center) which will act as a central hub for entrepreneurship development, offering a range of services and resources to foster the growth of local businesses. The potential business opportunities, and the indicative list includes various sectors comprise livestock (breeders, hatcheries, and input suppliers), aggregation and primary processing of NTFP (wild honey, herbs, Saal seeds, etc.), both which are activities where women are actively engaged and also in trading which will require more intensive support and hand holding to PVTG women in particular.

[196] Tors of service providers and implementors include ensuring that the principle of Free Prior and Informed Consent is implemented at all stages of the interaction with PVTGs

7. Further studies needed

[197] i) FPIC implementation plan/Indigenous Peoples Plan; ii) Environmental, Social and Climate Management Framework including the Environmental, Social and Climate Management Plan (ESMP); iii) Biodiversity Action Management Plan; iv) Labour Management Procedures

8. Monitoring and evaluation

[198] In the logical framework, the Project will use M&E indicators to measure climate resilience, natural resource management (NRM) practices, and nutrition aspects, including gender and youth issues. Where possible, all people-centered indicators will be disaggregated by gender and age, the inclusion of Peoples with disability should be consider as well. In addition, the project can evaluate the incorporation of the Biodiversity Core Indicators.

[199] - Outreach indicator: Number of people receiving services promoted or supported by the project disaggregated by gender, ethnicity and age group, by gender, ethnicity and age group.

[200] - Nutrition sensitive: Specify Households provided with targeted support to improve their nutrition (C.I.1.1.8 on Output). Disaggregate by households, household members, sex, youth, and indigenous peoples. Core outcome indicator C.I. 1.2.8: Percentage of women reporting minimum dietary diversity (MDDW)12; Disaggregation by women, households and household members

[201] - Core outcome indicator C.I. 1.2.9: Percentage of households with improved nutrition Knowledge Attitudes and Practices (KAP); Disaggregation by households and household members

[202] - Empowerment: Individuals demonstrating an improvement in empowerment (WEA index)

[203] - Environment and climate: Percentage of household reporting adoption of environmentally sustainable and climate resilient technology

9. References

Annual Budget, 2023-2024. Government of Odisha. https://finance.odisha.gov.in/sites/default/files/2023-02/people%20guide.pdf

Census of India 2011 - Data on demographic and social indicators for Odisha.

Climate Change Cell, Forest and Environment Department, Government of Odisha. https://climatechangecellodisha.org/

Climate Change and Development in Odisha - Institute of Economic Growth, Delhi University.

Department of Water Resources, Government of Odisha. http://www.dowrodisha.gov.in/WaterResources/WaterResourcesOverview.pdf

District-Level Poverty Estimation for Odisha by Using Small Area Estimation Technique. Directorate of Economics and Statistics, Planning and Convergence Department, Government of Odisha. http://www.desorissa.nic.in/pdf/small-area-estimation-technique.pdf

ENVIS Centre of Odisha's State of Environment. Hosted by Forest & Environment Department, Odisha. http://orienvis.nic.in/index1.aspx?lid=23&mid=1&langid=1&linkid=5925

Environmental Impact Assessment (EIA) reports of major development projects in Odisha.

Forest and Environment Department, Government of Odisha. https://forest.odisha.gov.in/about-us/about-department

Forest Survey of India (FSI) Reports on Forest Cover and Biodiversity in Odisha.
GCF and NABARD. Groundwater recharge and solar micro-irrigation to ensure food security and enhance resilience in vulnerable tribal areas of Odisha. https://www.nabard.org/auth/writereaddata/File/ESMP_%20GCF%20Odisha%20Project_English.pdf

Hoda, A., Gulati, A., Wardhan, H., Rajkhowa, P. (2021). Drivers of Agricultural Growth in Odisha. Revitalizing Indian Agriculture and Boosting Farmer Incomes. India Studies in Business and Economics. Springer, Singapore. https://doi.org/10.1007/978-981-15-9335-2_9

National Climate Vulnerability Assessment Reports - Indian Network on Climate Change Assessment (INCCA).

National Multidimensional Poverty Index Baseline Report. NITI AAYOG 2021. https://www.niti.gov.in/sites/default/files/2021-11/National_MPI_India-11242021.pdf

Odisha Agriculture Statistics - Directorate of Agriculture & Food Production, Government of Odisha.

Odisha State Action Plan on Climate Change (SAPCC) - Government of Odisha, India.

Odisha State Disaster Management Authority (OSDMA) - Reports and Publications.

Odisha Climate Change Action Plan 2018-23, Published by Forest, Environment & Climate Change Department, Government of Odisha. https://climatechangecellodisha.org/pdf/State%20Action%20Plan%20on%20Climate%20Change%202018-23.pdf

Odisha Climate Change Action Plan 2021-30, Published by Forest, Environment & Climate Change Department, Government of Odisha.

Environmental and Social Safeguards Classification: Substantial

Environmental and Social Safeguards				
Biodiversity conservation	**Yes/No/TBD**	**Likelihood**	**Consequence**	**Risk Rating**
1.1 Could the project potentially involve or lead to conversion or degradation of biodiversity, habitats (including modified habitat, natural habitat and critical natural habitat) and/or ecosystems and ecosystem services?	TBD	Likely	Major Project will significantly affect modified habitat and natural habitat, but will have no impact on critical natural habitat.	Substantial
1.2 Could the project involve or potentially lead to activities involving habitats that are legally protected, officially proposed for protection, or recognized as protected by traditional local communities and/or authoritative sources (e.g. National Park, Nature Conservancy, Indigenous Community Conserved Area, ICCA, etc.)?	Yes	Likely	Minor Project is close to a protected area, and associated facilities may have an indirect impact unless the project is modified	Moderate
1.3 Could the project potentially involve or lead to an increase in the chance of human-wildlife encounters/conflict?	TBD	Possible	Moderate Conflict leads to some loss of livelihood or threat to wildlife, but this is not catastrophic	Moderate
1.4 Could the project potentially involve or lead to risks to endangered species (e.g. reduction, encroachment on habitat)?	TBD	Possible	Negligible No net loss in biodiversity, regardless of conservation status.	Low
1.5 Could the project potentially involve or lead to impacts/risks to migratory wildlife?	TBD	Possible	Negligible No impact on migratory	Low

			wildlife	
1.6 Could the project potentially involve or lead to introduction or utilization of any invasive alien species of flora and fauna, whether accidental or intentional?	No			Low
1.7 Could the project involve or lead to the handling or utilization of genetically modified organisms?	Yes	Possible	Minor Possible introduction of genetically modified organisms, but the project can be modified to exclude them if stakeholder concerns are high.	Moderate

Environmental and Social Safeguards				
1.8 Could the project involve or lead to procurement through primary suppliers of natural resource materials?	TBD	Possible	Minor Poject may possibly require procurement of natural resources through primary suppliers, and resource extraction is tightly regulated. Alternatives to procurement of natural resources through primary suppliers exists.	Moderate
Resource Efficiency and Pollution Prevention	**Yes/No/TBD**	**Likelihood**	**Consequence**	**Risk Rating**
2.1 Could the project involve or lead to the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse	TBD	Possible	Moderate Pollutants	Moderate

local, regional, and/or transboundary impacts?			may possibly be released, either routinely or by accident, but treatment systems are proven and verified. Receiving environment is highly senstive.	
2.2 Could the project involve or lead to primary not environmentally sustainable production of living natural resources? (Note: this includes the cultivation or rearing of plants or animals, including annual and perennial crop farming, animal husbandry (including livestock), aquaculture, plantation forestry, etc)	Yes	Likely	Minor Project is partly dependent on production of living natural resources, but not enough to require serious environmental or social controls.	Moderate
2.3 Could the project involve or lead to engagement in areas of forestry, including the harvesting of natural forests, plantation development, and/or reforestation?	Yes	Likely	Minor Only a small component of the project is focused on forestry, and this aspect is well regulated.	Moderate
2.4 Could the project involve or lead to significant consumption of raw materials, energy, and/or water?	TBD	Possible	Minor The project will require consumption of raw materias, energy, and/or water, but this will be a small component of the project, and impacts can be appropriately managed.	Moderate

Environmental and Social Safeguards				
2.5 Could the project involve or lead to significant extraction, diversion or containment of surface or ground water (e.g. construction of dams, reservoirs, river basin developments, groundwater extraction)?	No			Low
2.6 Could the project involve inputs of fertilizers and other modifying agents?	Yes	Almost certain	Moderate The project will not encourage the use of fertilizers and pesticides. Local communities don't use these as the conduct sustainable and resilient practices most of the times and also because their price is too expensive.	Moderate
2.7 Could the project involve or lead to procurement, supply and/or result in the use of pesticides on crops, livestock, aquaculture or forestry?	Yes	Almost certain	Moderate The project will not encourage the use of pesticides.	Moderate
2.8 Could the project be located in an area which is being, or has been, polluted by an external source (e.g. a mine, smelter, industry)?	Yes	Likely	Minor The project is located in an area of previous pollution, but complete decontamination has been undertaken.	Moderate
2.9 Could the project involve livestock – extensive and intensive systems and animal products (dairy, skins, meat, etc.)?	Yes	Likely	Minor The project involves livestock or fisheries, but not in extensive or intensive systems.	Moderate

Cultural Heritage	Yes/No/TBD	Likelihood	Consequence	Risk Rating

Environmental and Social Safeguards				
3.1 Could the project be located in areas that are considered to have archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values or contains features considered as critical cultural heritage?	Yes	Likely	Moderate Prior to the project intervention, the FNGO are collectinh several information regarding agroecological and cultural practices. They also collect all sites nearby the village and project intervention mapping out out cultural / social with the communities. In case of a critical cultural heritage proximity the the project will adequately plan.	Moderate
3.2 Could the project directly or indirectly affect indigenous peoples' rights, lands, natural resources, territories, livelihoods, knowledge, social fabric, traditions, governance systems, and culture or heritage (tangible and intangible)?	Yes	Likely	Moderate Moderate impact on indigenous population. The FNGO work is based on PRA and inclusive reflective action to embed traditional knowledge.	Moderate

3.3 Could the project involve or lead to significant excavations, demolitions, movement of earth, flooding or other environmental changes?	TBD	Possible	Minor Short-term nuisance. No damage to land, assets, resources, and/or cultural heritage.	Moderate

Environmental and Social Safeguards				
3.4 Could the project involve or lead to adverse impacts to sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture (e.g. knowledge, innovations, practices)? (Note: projects intended to protect and conserve Cultural Heritage may also have inadvertent adverse impacts)	TBD	Possible	Minor The project is thought to be close to an area that is considered to have archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values or contains features considered as critical cultural heritage. The site has been comprehensively surveyed, and all tanglible and intangible cultural heritage is well known.	Moderate
3.5 Could the project involve or lead to alterations to landscapes and natural features with cultural significance?	TBD	Possible	Minor Short-term alterations to landscapes. No damage to/or loss of access to indigenous land, assets, resources, and/or cultural heritage. Rehabiliation is straightforward.	Moderate

3.6 Could the project involve or lead to utilization of tangible and/or intangible forms (e.g. practices, traditional knowledge) of Cultural Heritage for commercial or other purposes?	Yes	Likely	Minor The project is located in an area that is considered to be of high cultural heritage value, but the project has no commercial value or interest.	Moderate
indigenous peoples	**Yes/No/TBD**	**Likelihood**	**Consequence**	**Risk Rating**
4.1 Could the project be sited in areas where indigenous peoples are present (including the project area of influence)?	Yes	Almost certain	Major The project is sited in an area that is contiguous with an indigenous community. Impacts may be significant unless the project is properly planned.	Substantial

Environmental and Social Safeguards				
4.2 Could the project result in activities located on lands and territories claimed by indigenous peoples?	Yes	Almost certain	Major The project is sited entirely within an area that is currently the subject of a claim by indigenous people, but the legality of this claim is not clear.	Substantial
4.3 Could the project result in impacts on the rights of indigenous peoples or to the lands, territories and resources claimed by them?	Yes	Almost certain	Major Significant impact on indigenous population. Damage to/or protracted loss of access to indigenous land, assets, resources, and/or cultural heritage.	Substantial
4.4 Could the project result in the utilization and/or commercial development of natural resources on lands and territories claimed by indigenous peoples?	Yes	Almost certain	Major A significant component of the project involves use of natural resources for commercial purposes. The project could possibly be redesigned to exclude the commercial component, if stakeholder objections were strong.	Substantial

4.5 Could the project lead to impacts on the Cultural Heritage of indigenous peoples, including through the commercialization or use of their traditional knowledge and practices?	Yes	Almost certain	Major A significant component of the project involves use of cultural heritage for commercial purposes. The project could possibly be redesigned to exclude the commercial component, if stakeholder objections were strong.	Substantial
Labour and Working Conditions	**Yes/No/TBD**	**Likelihood**	**Consequence**	**Risk Rating**

Environmental and Social Safeguards				
5.1 Could the project operate in sectors or value chains that are characterized by working conditions that do not meet national labour laws or international commitments? (Note: this may include discriminatory practices, high gender inequality and the lack of equal opportunities, denial of freedom of association and collective bargaining, labour migrants)	Yes	Likely	Moderate The project operates in sectors or value chains that have, in the past, not met national labour laws, or international commitments, but is now adequately nationally regulated. However, international value chains are not regularly audited for environmental or social performance.	Moderate
5.2 Could the project use or operate in a value chain where there have been reports of forced labour? (Note: Risks of forced labour may be increased for projects located in remote places or where the status of migrant workers is uncertain)	No			Low
5.3 Could the project involve children (a) below the nationally-defined minimum employment age (usually 15 years old) or (b) above the nationally-defined minimum employment age but below the age of 18 in supported activities or in value chains?	No			Low
5.4 Could the project: (a) operate in a sector, area or value chain where producers and other agricultural workers are typically exposed to significant occupational and safety risks, and/or (b) promote or use technologies or practices that pose occupational safety and health (OSH) risks for farmers, other rural workers or rural populations in general? (Note: OSH risks in agriculture might include: dangerous machinery and tools; hazardous chemicals; toxic or allergenic agents; carcinogenic substances or agents; parasitic diseases; transmissible animal diseases; confined spaces; ergonomic hazards; extreme temperatures; and contact with dangerous and poisonous animals, reptiles and insects. Psychosocial hazards might include violence and harassment.)	TBD	Possible	Minor The project operates in a sector, area, or value chain where workers are occasionally exposed to significant OSH risks, and where regulation is known to be effective.	Moderate

Community Health, Safety and Security	Yes/No/TBD	Likelihood	Consequence	Risk Rating
6.1 Could the project be at risk from water-borne or other vector- borne diseases (e.g. temporary breeding habitats), and/or communicable and non-communicable diseases?	Yes	Likely	Moderate The project is situated in an area where there is past evidence of negative impacts from water-borne or other vector-borne diseases, or communicable /non-communicable diseases, but where regulation or containment of these impacts has been shown to be effective.	Moderate

Environmental and Social Safeguards				
6.2 Could the project lead to unintended negative impacts on nutrition?	No			Low
6.3 Is there a possibility of harm or losses due to failure of structural elements of the project (e.g. collapse of buildings or infrastructure)?	No			Low
6.4 Could the project involve or lead to the construction or rehabilitation of dams?	TBD	Possible	Minor The project involves the rehabilitation of dam(s) and/or reservoir(s) meeting at least one of the following criteria: - less than 10 metre high wall; - less than 300m long crest; or - less than 1 million m3 reservoir capacity.	Moderate
6.5 Could the project involve or lead to transport, storage, and use and/or disposal of hazardous or dangerous materials (e.g. explosives, fuel and other chemicals during construction and operation)?	TBD	Possible	Minor The project has only minor involvement with the transport, storage, and use and/or disposal of hazardous or dangerous materials, and regulation of hazardous materials is effective.	Moderate

6.6 Could the project lead to adverse impacts on ecosystems and ecosystem services relevant to communities' health (e.g. food, surface water purification, natural buffers from flooding)?	TBD	Unlikely	Minor The project will only have minor impacts on ecosystem services, and these can be mitigated through standard environmental management planning.	Low
6.7 Could the project lead to the potential for gender-based violence, including sexual harassment, exploitation and abuse, as a result of labour influx, land redistribution, or other actions that alter community dynamics?	Yes	Possible	Moderate Moderate changes to community dynamics may result in increased potential for gender-based violence or sexual exploitation. Gender-based violence interventions are integrated into project design.	Moderate

Environmental and Social Safeguards				
6.8 Could the project lead to increases in traffic or alteration in traffic flow?	No			Low
6.9 Could the project lead to an influx of project workers?	TBD	Possible	Negligible The project does not require an influx of project workers	Low
6.10 Could the project involve or lead to the engagement of security personnel to protect facilities and property or to support project activities?	No			Low
Physical and economic resettlement	**Yes/No/TBD**	**Likelihood**	**Consequence**	**Risk Rating**
7.1 Could the project result in temporary or permanent and full or partial physical displacement (including people without legally recognizable claims to land)?	Yes	Likely	Minor Run-off river schemes are based on socio-environment, economic and technical feasibility study which evidence that there will be no submergence affecting the villages settled on the upstream of reservoir area.	Moderate
7.2 Could the project result in economic displacement (e.g. loss of assets or access to resources due to land acquisition or access restrictions – even in the absence of physical relocation)?	Yes	Possible	Minor No loss of assets or access to resources since the project will not cause resettlement	Moderate
7.3 Could the project present a risk of forced evictions?	TBD	Possible	Minor	Moderate

7.4 Could the project result in impacts on or changes to land tenure arrangements and/or community-based property rights/customary rights to land, territories and/or resources?	Yes	Almost certain	Minor The project will result in minor impacts on or changes to land tenure arrangements and/or community-based property rights/customary rights. Legal recourse and other forms of arbitration/conflct resolution are available.	Moderate
Financial intermediaries and direct investments	**Yes/No/TBD**	**Likelihood**	**Consequence**	**Risk Rating**
Environmental and Social Safeguards				
8.1 Could the investment be granted to an institution that does not have an environmental and social policies and an associated environmental and social management system (ESMS) in place (transparent, publicly available)?	No			Low
8.2 Could the investment be granted to an institution with insufficient capacities (i.e. unqualified personnel e.g. ES Officer) to implement the ESMS?	No			Low
8.3 Could the investment be granted to an institution that does not have an Exclusion List?	No			Low
8.4 According to the institution's portfolio classification: Could the institution have potential high-risk projects in their portfolio?	No			Low
8.5 Is there evidence that the institution does not comply with the local legal framework?	No			Low
8.6 Does the institution provide a stable communication channel with stakeholders and local communities (e.g. a Grievance Redress Mechanism)?	No			Low
8.7 Does the organization provide auxiliary or capacity building support services.	No			Low

Climate Risk Classification: Moderate

Step 1: Hazard identification	
What are the expected hazards in the project intervention area?	**No, Yes, TBD**
River flood	No
Costal Flood	No
Urban Flood	No
Landslide	Yes
Cyclone	Yes
Water Scarcity (agricultural droughts and/or dry spells)	Yes
Extreme Heat	Yes
Wildfires	Yes
Future climate scenarios foreseen (period 2040-2059) - Change in frequency and intensity	**No, Yes, TBD**
Change in temperature (increase or decrease)	Yes
Change in rainfall (increase or decrease)	No
Climate variability (larger or smaller)	Yes
Intensity and frequency of extreme events (larger or smaller)	Yes
Is the project expected to have an impact on climate?	**No, Yes, TBD**
Is the project expected to be a significant emitter of greenhouse gases?	No
Step 2: Exposure Assessment	
Is the project located in exposed areas to weather-related natural hazards?	**No, Yes, TBD**
Low-lying areas (valleys, coastal zones, and small islands)	No
Very warm areas (subtropical)	Yes
Tropical areas (rainforests)	No
Arid and semi-arid areas (deserts)	No
Mountains zones and permafrost areas (tundra)	No
River banks	Yes
Does the project target agricultural systems, ecosystems or livelihoods exposed to weather-related hazards?	**No, Yes, TBD**
Is crop production frequently affected by rainfall variability, prolonged droughts, changes in temperature or pests and diseases?	Yes
Is livestock productivity frequently affected by rainfall variability, prolonged droughts, changes in temperature or diseases?	Yes
Are fisheries frequently affected by ocean acidification, water salinity and changes in sea surface temperature due to ocean-atmospheric oscillations or climate change?	No
Is forest productivity frequently affected by wildfires, diseases, rainfall variability, prolonged droughts, or changes in temperature?	Yes
Is the biodiversity in the project area likely to be affected by changes in climate variables?	Yes
Is any stage of the agricultural value chain (production, storage, processing and marketing) exposed to climate related hazards?	Yes

Is any rural infrastructure likely to be affected by flooding, landslides, changes in temperatures, and extreme winds.	Yes
Step 3: Sensitivity Assessment	
What are key sensitivities for the populations in the project's areas of intervention?	**No, Yes, TBD**
Is conflict exacerbating the population's sensitivity to weather related hazards?	No
Is population displacement being exacerbated by climate change impacts?	No
Are diseases (e.g. COVID-19, malaria, cholera) increasing the population´s vulnerability and affecting their capacity to address potential weather-related hazards?	Yes
Is the income of the target population predominately coming from agriculture?	Yes
Are social inequalities (e.g. based on gender, youth, indigenous persons and other marginalized groups) being exacerbated by climate change?	Yes
Is the Human Development Index (HDI) equal to or below 0.6?	Yes
Is the Multidimensional Poverty Index (MPI) equal to or above 0.1?	Yes
Step 4: Adaptive capacity and climate resilience	
What are key adaptive capacities in the areas of project intervention?	**No, Yes, TBD**
Is the country well ranked in the Disaster risk reduction progress score?	Yes
Are climate and weather information services (real-time weather data, seasonal forecasts etc.) effectively being delivered (through radio, TV, SMS, extension services etc.) to farmers, rural dwellers, and end users?	Yes
Does the project country have an early action plan (preparedness and emergency response) to mitigate the impacts of weather-related hazards once the shock occurs?	Yes
Does the government or other institutions support the target population/communities with the necessary social and economic resources to prepare for or respond to climate-related events?	Yes
Is the target community carrying out (using their own means) agricultural adaptation?	Yes
Does the target population have the economic means or support to adjust or adapt their activities in response to weather related shocks?	No
Do policies/mechanisms exist that make financial credit, loans, and agricultural insurance available?	No
Are rural infrastructures effectively delivering services to farmers and rural dwellers?	No