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Report No: PAD3549

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED LOAN

IN THE AMOUNT OF US\$100 MILLION

TO

INDIA

FOR A

CHHATTISGARH INCLUSIVE RURAL AND ACCELERATED AGRICULTURE GROWTH  
PROJECT

NOVEMBER 20, 2020

Agriculture And Food Global Practice  
South Asia Region

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## CURRENCY EQUIVALENTS

(Exchange Rate Effective October 31, 2020)

Currency Unit = Indian Rupee (INR)

INR 74.52 = US\$1

FISCAL YEAR  
April 1 - March 31

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## ABBREVIATIONS AND ACRONYMS

<i>Beej Nigam</i>	Chhattisgarh State Seed and Agriculture Development Corporation Limited
BPIU	Block Program Implementation Units
CHIRAAG	Chhattisgarh Inclusive, Rural and Accelerated Agriculture Growth Project
COVID-19	Coronavirus Disease 2019
CRC	CHIRAAG Resource Committee
CSA	Climate Smart Agriculture
DoAB	Department of Agriculture Development and Farmer Welfare and Biotechnology
DPMU	District Project Management Unit
EIRR	Economic Internal Rate of Return
ESCP	Environmental and Social Commitment Plan
ESMF	Environmental and Social Management Framework
FM	Financial Management
FPO	Farmer Producer Organizations
GBV	Gender-Based Violence
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GoI	Government of India
GoCG	Government of Chhattisgarh
<i>GP</i>	<i>Gram Panchayat</i>
ICT	Information and Communications Technology
IEC	Information, Education and Communications
IFAD	International Fund for Agriculture Development
IFS	Integrated Farming System
IGKV	Indira Gandhi Krishi Vishwavidyalaya
INRM	Integrated Natural Resource Management
KVK	Krishi Vigyan Kendra
LG	Livelihood Group
LWE	Left-Wing Extremism
MIS	Management Information System
MSME	Micro, Small and Medium Enterprises
NGGB	Narwa, Garuwa, Ghuruwa, Baadi
PDO	Project Development Objective
PPSD	Project Procurement Strategy for Development
SBCC	Social and Behavior Change Communication
SC	Scheduled Caste
SHG	Self-Help Group
SPMU	State Project Management Unit
STEP	Systematic Tracking of Exchanges in Procurement
ST	Scheduled Tribe
TSA	Technical Support Agency
VCDC	Value Chain Development Cell
VDP	Village Development Plan
WASH	Water, Sanitation and Hygiene
WBG	World Bank Group

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## DATASHEET

### BASIC INFORMATION

Country(ies)	Project Name	
India	Chhattisgarh Inclusive Rural and Accelerated Agriculture Growth Project	
Project ID	Financing Instrument	Environmental and Social Risk Classification
P170645	Investment Project Financing	Moderate

### Financing & Implementation Modalities

<input type="checkbox"/> Multiphase Programmatic Approach (MPA)	<input checked="" type="checkbox"/> Contingent Emergency Response Component (CERC)
<input type="checkbox"/> Series of Projects (SOP)	<input type="checkbox"/> Fragile State(s)
<input type="checkbox"/> Performance-Based Conditions (PBCs)	<input type="checkbox"/> Small State(s)
<input type="checkbox"/> Financial Intermediaries (FI)	<input type="checkbox"/> Fragile within a non-fragile Country
<input type="checkbox"/> Project-Based Guarantee	<input type="checkbox"/> Conflict
<input type="checkbox"/> Deferred Drawdown	<input type="checkbox"/> Responding to Natural or Man-made Disaster
<input type="checkbox"/> Alternate Procurement Arrangements (APA)	<input type="checkbox"/> Hands-on Enhanced Implementation Support (HEIS)

Expected Approval Date	Expected Closing Date
15-Dec-2020	31-Jul-2026

Bank/IFC Collaboration

No

### Proposed Development Objective(s)

The PDO of the proposed project is to improve income opportunities and the availability of nutritious foods in targeted households of Chhattisgarh's tribal-dominated areas.

### Components

Component Name	Cost (US\$, millions)
1. Community Empowerment and Institutional Strengthening	14.90



2. Diversified, Resilient and Nutrition-Supportive Food and Agriculture Systems	48.50
3. Value Addition and Market Access	10.30
4. COVID-19 Economic Recovery Response	15.10
5. Project Management, Monitoring and Knowledge	11.20
6. Contingency Emergency Response Component	0.00

### Organizations

Borrower: India, Ministry of Finance

Implementing Agency: Chhattisgarh, Department of Agriculture Development and Farmer Welfare and Biotechnology

### PROJECT FINANCING DATA (US\$, Millions)

#### SUMMARY

Total Project Cost	142.60
Total Financing	142.60
of which IBRD/IDA	100.00
Financing Gap	0.00

#### DETAILS

##### World Bank Group Financing

International Bank for Reconstruction and Development (IBRD)	100.00
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##### Non-World Bank Group Financing

Counterpart Funding	42.60
Borrower/Recipient	42.60

### Expected Disbursements (in US\$, Millions)

WB Fiscal Year	2020	2021	2022	2023	2024	2025	2026	2027
Annual	0.00	3.00	18.00	20.00	22.00	20.50	15.00	1.50
Cumulative	0.00	3.00	21.00	41.00	63.00	83.50	98.50	100.00



## INSTITUTIONAL DATA

### Practice Area (Lead)

Agriculture and Food

### Contributing Practice Areas

Health, Nutrition & Population, Social Sustainability & Inclusion

### Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

## SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	● Moderate
2. Macroeconomic	● Moderate
3. Sector Strategies and Policies	● Moderate
4. Technical Design of Project or Program	● Substantial
5. Institutional Capacity for Implementation and Sustainability	● Substantial
6. Fiduciary	● Substantial
7. Environment and Social	● Moderate
8. Stakeholders	● Substantial
9. Other	
10. Overall	● Substantial

## COMPLIANCE

### Policy

Does the project depart from the CPF in content or in other significant respects?

☐ Yes ☒ No

Does the project require any waivers of Bank policies?

☐ Yes ☒ No



## Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
Assessment and Management of Environmental and Social Risks and Impacts	Relevant
Stakeholder Engagement and Information Disclosure	Relevant
Labor and Working Conditions	Relevant
Resource Efficiency and Pollution Prevention and Management	Relevant
Community Health and Safety	Relevant
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Not Currently Relevant
Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Relevant
Cultural Heritage	Relevant
Financial Intermediaries	Not Currently Relevant

**NOTE:** For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

## Legal Covenants

### Sections and Description

The Project Implementing Entity shall establish within three (3) months from the Effective Date and maintain throughout the period of project implementation, a Project Advisory Committee, chaired by the chief secretary of Chhattisgarh; which committee shall have composition, functions and responsibilities acceptable to the Bank, including providing overall oversight and policy guidance for project implementation;

### Sections and Description

The Project Implementing Entity shall establish within three (3) months from the Effective Date and maintain throughout the period of project implementation, a Project Steering Committee, chaired by the Agriculture Production Commissioner, and including representatives from relevant departments and agencies; which committee shall have functions and responsibilities acceptable to the Bank, including approving the project's annual work plans and budgets and assisting with inter-departmental coordination and convergence;

### Sections and Description





The Project Implementing Entity shall establish within one (1) month from the Effective Date and maintain throughout the period of project implementation, a State Project Management Unit (SPMU) within the DoAB, to be headed by a project director and comprising staff from relevant departments and agencies and consultants in financial management, procurement, monitoring and evaluation, social development, gender, and environmental safeguards, and other experienced and qualified staff and consultants, all in sufficient numbers and under terms of reference acceptable to the Bank. The SPMU shall be responsible for day-to-day project implementation and monitoring, and shall have functions and responsibilities acceptable to the Bank, including preparing annual work plans and budgets and ensuring all project activities are planned, financed and implemented accordingly; ensuring project implementation is in accordance with the Project Implementation Plan (PIP), Community Operation Manual (COM) and COVID-19 Economic Recovery Response Manual (CERRM); ensuring that procurement and financial management activities are carried out in a timely manner in accordance with the PIP, COM and CERRM; ensuring social and environmental safeguards/standards compliance; monitoring project activities; and preparing quarterly and annual project progress reports, mid-term report and end-term report and ensuring their timely submission to the Bank;

#### Sections and Description

The Project Implementing Entity shall establish within one (1) month of the Effective Date, and maintain throughout the period of project implementation, District Project Management Units (DPMUs) in each of the targeted districts as enumerated in the PIP, chaired by the respective district project managers and comprising of experienced and qualified staff and consultants, in sufficient numbers and under terms of reference acceptable to the Bank, which unit shall be responsible for day-to-day project implementation at the district level and ensuring that project activities are included in the district development plans;

#### Sections and Description

The Project Implementing Entity shall establish within one (1) month of the Effective Date, and maintain throughout the period of project implementation, Block Project Implementation Units (BPIUs) in each of the targeted blocks as enumerated in the PIP, chaired by the respective block project managers and comprising of experienced and qualified staff and consultants, in sufficient numbers and under terms of reference acceptable to the Bank, which unit shall be responsible for day-to-day project implementation at the block level.

#### Sections and Description

For purposes of carrying out the activities under Part 2.1(iii), 2.2(i) and Part 3.2(iii) of the project, the Project Implementing Entity shall ensure that Grants are made to selected Community Institutions (“Beneficiaries”) in accordance with the eligibility criteria and procedures set forth in the COM.

Upon selection of Beneficiaries based on grant proposals submitted by the Community Institutions in accordance with the COM, the Project Implementing Entity shall issue a Grant Approval Letter to each Beneficiary, under terms and conditions acceptable to the Bank, as set forth in the COM

#### Sections and Description

The Project Implementing Entity shall no later than one (1) month of the Effective Date, prepare, approve and adopt a COVID-19 Economic Recovery Response Manual (CERRM) in a manner and substance satisfactory to the Bank, and thereafter carry out Part 4 of the project in accordance with the provisions of the CERRM, which manual shall include, inter alia the activities, implementation arrangements and monitoring mechanisms for Part 4 of the project;



#### Sections and Description

The Project Implementing Entity shall: (a) ensure that the Project's activities involving collection, storage, usage, and/or processing of Personal Data are carried out with due regard to the Borrower's existing legal framework and appropriate international data protection and privacy standards and practices; and (b) in the event that, during the implementation of the Project, the approval of any new legislation regarding Personal Data protection may have an impact on the activities financed by the Project, ensure that a technical analysis of said impact is conducted, and that the necessary recommendations and adjustments, are implemented, as appropriate; and

#### Sections and Description

The Project Implementing Entity shall no later than three (3) months of the Effective Date, prepare, approve and adopt a Community Operation Manual (COM) in a manner and substance satisfactory to the Bank, and thereafter carry out Parts 2.1(iii), 2.2(i) and 3.2(iii) of the Project in accordance with the provisions of the COM, which manual shall include, inter alia the criteria and process of selection of Beneficiaries to receive Grants, financial management and procurement requirements, monitoring and evaluation procedures, reporting arrangements, and the model form for the Grant Approval Letter.

#### Conditions

Type Disbursement	Description No withdrawal shall be made for payments made prior to the Signature Date.
Type Disbursement	Description No withdrawal shall be made under Category (2), unless and until the Project Implementing Entity has prepared, approved and adopted the Community Operations Manual (COM) in a manner and substance satisfactory to the Bank.
Type Disbursement	Description No withdrawal shall be made under Category (3), unless and until the Project Implementing Entity has prepared, approved and adopted the COVID-19 Economic Recovery Response Manual (CERRM) in a manner and substance satisfactory to the Bank.
Type Disbursement	Description No withdrawal shall be made under Category (4), unless and until the Bank is satisfied, and has notified the Borrower and the Project Implementing Entity of its satisfaction, that all of the following conditions have been met:  (i) the Borrower and the Project Implementing Entity have determined that an Eligible Crisis or Health Emergency has occurred, have furnished to the Bank a request to include certain activities in the Contingency Emergency Response Component (CER Component) in order to respond to said Eligible Crisis or Health Emergency, and the Bank has agreed with such determination, accepted said request, and notified the Borrower and the Project Implementing Entity thereof;



	<p>(ii) the Project Implementing Entity has prepared and disclosed all safeguard instruments, acceptable to the Bank, required for said activities, and has implemented any actions which are required to be taken under said instruments all in accordance with the provisions of Section I.G.4(b) of the Schedule to the Project Agreement;</p> <p>(iii) the Project Implementing Entity has provided sufficient evidence satisfactory to the Bank, that the Coordinating Authority has adequate staff and resources in accordance with the provision of Section I.G.3 of the Schedule to the Project Agreement, for the purposes of said activities; and</p> <p>(iv) the Project Implementing Entity has adopted a Contingent Emergency Response Component Manual (CERCM) in form, substance and manner acceptable to the Bank and the provisions of the CERCM remain, or have been updated in accordance with the provisions of Section I.G.1(a) of the Schedule to the Project Agreement, so as to be appropriate for the inclusion and implementation of said activities under the respective CER Component.</p>
Type Disbursement	<p>Description</p> <p>The Borrower shall not submit withdrawal applications under Category (3) for expenditures incurred after eighteen (18) months from the Effective Date.</p>



## I. STRATEGIC CONTEXT

### A. Country Context

1. **India's Gross Domestic Product (GDP) growth has slowed in the past three years, and the COVID-19 outbreak is expected to have a significant impact.** Growth has moderated from an average of 7.4% during FY15/16-FY18/19 to an estimated 4.2% in FY19/20. The growth deceleration was due mostly to unresolved domestic issues (impaired balance sheets in the banking and corporate sectors), which were compounded by stress in the non-banking segment of the financial sector, and a marked decline in consumption on the back of weak rural income growth. Against this backdrop, the outbreak of COVID-19 and the public health responses adopted to counter it have significantly altered the growth trajectory of the economy, which is now expected to contract sharply in FY20/21. On the fiscal side, the general government deficit is expected to widen significantly in FY20/21, owing to weak activity and revenues as well as higher spending needs. However, the current account balance is expected to improve in FY20/21, reflecting mostly a sizeable contraction in imports and a large decline in oil prices. Given this, India's foreign exchange reserves are expected to remain comfortable.

2. **Although India has made remarkable progress in reducing absolute poverty, the COVID-19 outbreak may have reversed the course of poverty reduction.** Between 2011-12 and 2017, India's poverty rate is estimated to have declined from 22.5% to values ranging from 8.1% to 11.3%. Recent projections of GDP per capita growth rate indicate that as result of the pandemic, poverty rates in 2020 have likely reverted to estimated levels in 2016<sup>1</sup>. The extent of vulnerability is reflected in labor market indicators from high frequency surveys. Data from the Centre for Monitoring Indian Economy (CMIE), shows urban households are facing greater vulnerabilities: between September-December 2019 and May-August 2020, the proportion of people working in urban and rural areas has fallen by 4.2 and 3.8 percentage points respectively. Approximately, 11% and 7% of urban and rural individuals, identifying themselves to be employed in the recent period, have performed zero hours of work in the past week. Short-term employment outlook is contingent on whether these temporarily unemployed workers can fully re-enter the labor force. Overall, the pandemic is estimated to have raised urban poverty, creating a set of new poor that are likely to be engaged in non-farm sector and receive at least secondary or tertiary education, as compared to existing poorer households who are predominantly rural with lower levels of education.

### B. Sectoral and Institutional Context

3. **Chhattisgarh is a relatively young state, with abundant natural resources and a mining-led economy.** Formed in 2000, it is one of the richest Indian states in terms of natural<sup>2</sup> and mineral resources.<sup>3</sup> While 80% of the state population is dependent on the agriculture sector, it contributes only 17% to gross state domestic product.<sup>4</sup> Agriculture, forestry, fisheries and animal husbandry are all significant contributors to the gross state domestic product at varying levels (12.4%, 10.9%, 5.5% and 20.4%,

<sup>1</sup> [http://macropovertyoutlook.worldbank.org/mpo\\_files/mpo/mpo-am20-ind-scope.pdf](http://macropovertyoutlook.worldbank.org/mpo_files/mpo/mpo-am20-ind-scope.pdf)

<sup>2</sup> Chhattisgarh is rich in biodiversity with 46% under forested area, the second-highest carbon stock in the country among large states, annual average rainfall of approximately 1,292 mm, groundwater development of 20% and four major river systems.

<sup>3</sup> Leading producer of coal, steel, tin and iron ore in the country and third highest in value of major mineral production.

<sup>4</sup> Economic Survey, Government of Chhattisgarh, 2019-20 <http://descg.gov.in/pdf/publications/latest/ES2019-20/EconomicSurvey2019-20.pdf>

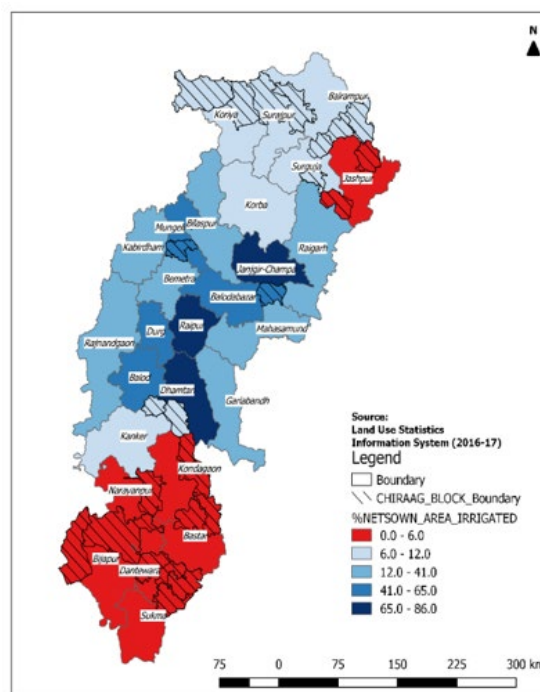


respectively).<sup>5</sup> However, state growth is led by the mining-driven manufacturing sector which contributes 47.65% of gross state domestic product. The past decade's overall state growth has been volatile and gross value-added growth in employment-intensive sectors remains low. Chhattisgarh has the lowest per-capita income in the country and the gap between it and the national average is widening.<sup>6</sup>

4. **Resource-use stress has constrained production.** The region's natural systems – forests, grazing land, aquatic bodies, soil, nutrients and biodiversity – enable a mixed production system which includes livestock production, inland fisheries and forestry which determine overall economic opportunities. However, uneven distribution of rainfall, reduced soil fertility due to erosion, delinked crop and animal husbandry, occasional droughts and the depletion of forests have put stress on an otherwise balanced ecosystem. The state's rich biodiversity<sup>7</sup> provides an opportunity for the state to facilitate sustainable growth across primary sub-sectors in an integrated manner. The three diverse agro-climatic zones of the Central Plains, Northern Hills and Southern Bastar Plateau are key enablers for further diversification.

5. **Farming is primarily smallholder, rainfed, single-cropped (paddy) and subsistence in nature.** About 76% of the state's 3.74 million farmers are small and marginal, own 34% of land and have an average landholding of 1.6 hectares. Rice is the major crop of the state (66% of cropped area), but the 'rice bowl' is restricted to the Central Plains where 35% of the state's irrigated area is concentrated. Combined, the north and south have less than 1% of net sown area irrigated (see Figure 1).<sup>8</sup> Average cropping intensity is low (138%), as is productivity across crops (food grain productivity: 1,532 kg/ha against national average of 2,101 kg/ha), with the lowest intensity in the southern area. The agriculture base is diversified with fruits (mango, tamarind, jackfruit, banana and papaya) and vegetables, spices, flowers, medicinal and aromatic plants, all in significant production, although marked by regional variations. Diversification at household-level in the southern region is limited, with the majority of farmers investing only in a single season largely due to erratic rainfall and low irrigation infrastructure. Low diversification of the cropping system and insufficient investment in appropriate irrigation and postharvest technology have limited household-level economic returns. A diversified primary sector is a key economic growth opportunity for the state.

Figure 1. Chhattisgarh State Map Depicting Percentage of Net Sown Area that is Irrigated



<sup>5</sup> Economic Survey, Government of Chhattisgarh, 2019-20 <http://descg.gov.in/pdf/publications/latest/ES2019-20/EconomicSurvey2019-20.pdf>

<sup>6</sup> States of Growth, CRISIL 2.0, 2019.

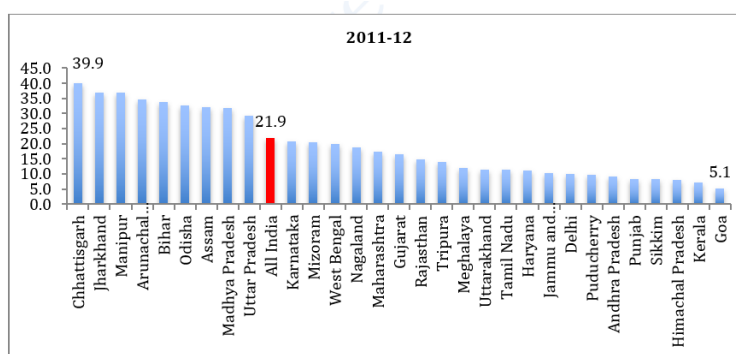
<sup>7</sup> Notably more than 19,116 varieties of rice are grown in the State.

<sup>8</sup> Census of India, 2011.



6. **High levels of poverty and malnutrition are concentrated in Chhattisgarh's northern and southern tribal-majority regions.** While Chhattisgarh has made progress over the past two decades in reducing income poverty as well as acute undernutrition, both continue to pose significant challenges. Home to 26 million people, Chhattisgarh has the highest poverty rate in India (40%), with poverty reduction lagging behind all other states (see Figure 2).<sup>9</sup> Most industrial development and primary sector growth is restricted to the central plain areas, while the highest concentration of poverty is in the northern and southern regions (13 out of 27 state districts). The inter-district variation in poverty is high in these regions with 7 out of 13 districts among the most backward in the country,<sup>10</sup> and 70% of the mostly tribal population dependent on agriculture and forest produce for their livelihood. Compared to the national average of 8.6%, Chhattisgarh has the highest proportion of tribal groups<sup>11</sup> (31.6%) in India among large states.<sup>12</sup> Approximately 700 tribes, officially designated as Scheduled Tribes (STs), enjoy special constitutional and legal safeguards recognizing their historical disadvantage. At 51%, ST poverty rate in Chhattisgarh registers among the highest poverty rates in India (see Figure 3a). In 9 out of the 13 districts, the number of undernourished and anemic women is higher than the state average.<sup>13</sup> These areas are further characterized by child undernourishment (see Figure 3b),<sup>14</sup> where 37% of children under 5 years have stunted growth, 38% are underweight, 23% are wasted and 47% of women in the reproductive age group are anemic.<sup>15</sup> Improvements in nutrition are, therefore, critical to the attainment of the state's human capital development and realization of its full earning potential.

Figure 2. Percentage of Population Below the Poverty Line (by State)



7. **Gaps in existing food and agriculture systems contribute to undernutrition and micronutrient deficiencies.** The key tenet of traditional tribal food systems was built around diversity – freely available forest foods (fruits and berries), cultivated millets, inland fisheries and hunted animals. Diversity in food systems has transformed with consumption habits (growing dependence on rice), access to naturally available foods (reduced access to forest produce for sale, climate change) and household economics (reduced incomes). The result has been low dietary diversity reflected by a Household Dietary Diversity Score (HDDS)<sup>16</sup> of 9.41 out of 12, with low intake of fruits, proteins and dairy products.<sup>17</sup> The daily dietary

<sup>9</sup> State Brief, World Bank Group (2016).

<sup>10</sup> Part of Government of India's Transformation of Aspirational Districts Program.

<sup>11</sup> Tribal groups or *Adivasis* are the earliest inhabitants of India and literally means 'Adi or earliest time', and 'vasi or resident of'.

<sup>12</sup> Census of India, 2011.

<sup>13</sup> <https://www.orfonline.org/expert-speak/hidden-failures-malnourished-south-health-nutrition-chhattisgarh-45474/>, Observer Research Foundation

<sup>14</sup> Why Invest in Nutrition? World Bank Group. <http://siteresources.worldbank.org/NUTRITION/Resources/281846-1131636806329/NutritionStrategyCh1.pdf>

<sup>15</sup> National Family Health Survey 2015-16.

<sup>16</sup> HDDS is a qualitative measure of food consumption that reflects household access to a variety of foods.

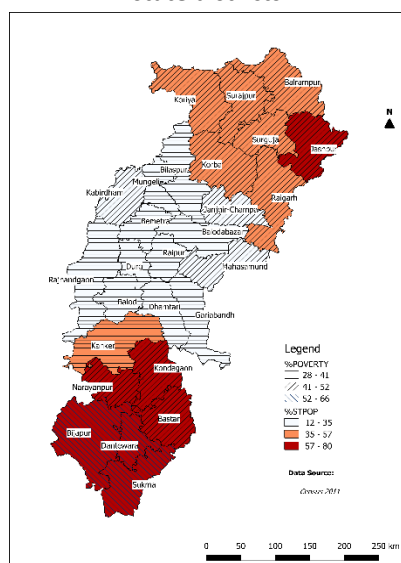
<sup>17</sup> India Food-Based Dietary Guidelines and Nutrition Intake in India, Report No. 560, National Sample Survey Organization, 2011.



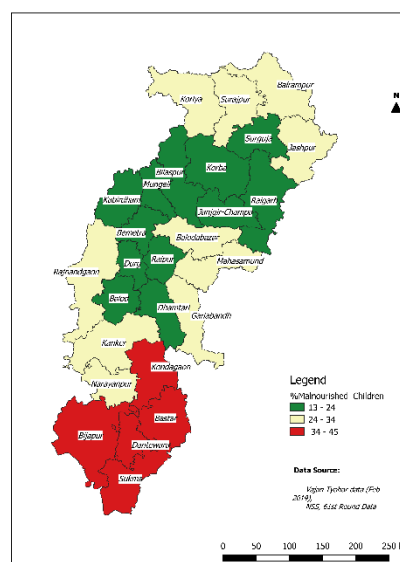


recommendation of 2,500 calories from various food groups costs approximately INR 130/person/day. For a family of five, this is INR 650/day or INR 19,500/month. Smallholdings and limited asset base inhibit STs' ability to meet the daily dietary recommendation and there is an urgent need to intensify production systems, diversify income sources through the creation of assets at the household level and optimally use available natural resources to increase food sources and dietary diversity. Nutrition-sensitive agriculture is a food-based approach to agricultural development that uses food fortification, nutritionally rich foods, and dietary diversity to overcome malnutrition and micronutrient deficiencies.<sup>18</sup> Combined with nutrition-supportive actions, steps which include nutrition and health behavior change communication and are carefully designed to empower women,<sup>19</sup> can support diversity, accessibility and consumption of nutritious food and address undernutrition and micro-nutrient deficiencies in mothers and children.

**Figure 1a. Percentage of spread of Scheduled Tribe population vis a vis poverty across state districts**



**Figure 2b. Percentage of malnourished children across state districts**



## 8. Low access to agri-finance and markets remain barriers for surplus producers and regional growth.

Weekly *haat bazars* (local markets), with temporary, informal and rudimentary market mechanisms, are the primary points of sale for tribal producers and entrepreneurs. The unorganized nature of these *haats*, high cost of aggregation and transportation, low bargaining power with traders and information asymmetry, limits the realization of market value for tribal farmers. Tribal farmers also depend on traders for non-institutional sources of credit since Chhattisgarh is among the bottom five states for access to institutional credit for agriculture and allied sectors, with credit flow as a percentage of state agriculture GDP at less than 40%.<sup>20</sup> In northern and southern districts, financial inclusion (branch, deposit, credit and

<sup>18</sup> Defined by Food and Agriculture Organization of the United Nation's (FAO).

<sup>19</sup> Marie T. Ruel, Agnes R. Quisumbing, and Mysbah Balagamwala. 2017. "Nutrition-Sensitive Agriculture: What Have We Learned and Where Do We Go from Here?" 01681. IFPRI Discussion Paper. Washington, DC: Poverty, Health, and Nutrition Division of the International Food Policy Research Institute (IFPRI).

<sup>20</sup> Report of Internal Working Group to Review Agricultural Credit, Reserve Bank of India, 2019.



insurance penetration) is among the lowest in the country.<sup>21</sup>

**9. Chhattisgarh is a climate hotspot, and rural women and tribal households face significant impacts.**

Chhattisgarh has the highest projected decrease in living standards (9.8%) under the carbon-intensive scenario by 2050.<sup>22</sup> Chhattisgarh's State Action Plan for Climate Change highlights the risks faced in the southern region due to overdependence on rainfed agriculture, animal husbandry, fisheries and forests. Declining forest cover and soil degradation are expected to further aggravate the resource constraints and disproportionately affect tribal poor households. Risk mitigation and adaption approaches under the State Action Plan for Climate Change include integrated natural resource management (INRM), nutrition-supportive and resilient integrated farming systems (IFS) following climate smart agriculture (CSA) and resource-efficient principles, and value chain approaches linked to profitable markets. In Chhattisgarh, women farm workers form almost 66% of the total labor force.<sup>23</sup> These figures are even higher for ST women. Primarily driven by male out-migration, apart from crop weeding, manuring and harvesting, women farm workers and women cultivators are the leading actors in all postharvest and storage operations.<sup>24</sup> However, their capacity and decision-making roles regarding management of resources, knowledge and skill sets to enhance productivity and access technology effectively remain limited.<sup>25</sup> Climate shifts combined with: (a) high dependence on marginal agriculture and allied activities; (b) low access to agriculture technology and postharvest technology; (c) low levels of skilling; (d) low resource management capacity; and (e) stagnant productivity outcomes have a higher impact on women farm workers and women cultivators compared to men.

**10. Left-wing extremism (LWE), state service delivery and access to economic opportunities are inter-linked factors for Chhattisgarh's inclusive growth.** Chhattisgarh has, in the past, been affected by LWE that has impacted the state's service delivery and access to economic opportunities. The Government of India's (GoI) multi-pronged strategy<sup>26</sup> to address these historical issues aims to strengthen state service delivery, improve community participation and enable access to entitlements and state-led developmental initiatives. Addressing social unrest by diversifying economic opportunities is thus central to the development of the state.

**11. The COVID-19 pandemic has severely disrupted people's access to food, income, social services and economic opportunities, especially in rural and tribal areas.** With job opportunities unlikely to return to normal under the current depressed economic situation, many migrant laborers have returned to their villages in Chhattisgarh, thus potentially aggravating the rural joblessness situation. Household incomes in remote tribal areas have been particularly affected, with many dependent on remittances, collection of minor forest produce and subsistence agriculture. Though the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and the newly launched *Garib Kalyan Rojgar Yojana*<sup>27</sup> have eased the pressure on rural jobs search, the need to create more income and job opportunity around both farm

<sup>21</sup> Seven of the bottom 50 districts in India on financial inclusion fall in northern and southern Chhattisgarh region, CRISIL Inclusive 2018. Branch penetration, deposit penetration, credit penetration, and insurance penetration - into one metric.

<sup>22</sup> India's Hotspots: The Impact of Precipitation and Temperature Change on Living Standards, World Bank Group [2018]

<sup>23</sup> Climate change affecting women farmers the most in Chhattisgarh, Oxfam India, 2015

<sup>24</sup> A study on status of agriculture and role of women in agriculture of Chhattisgarh state; 2016

<sup>25</sup> Observations based on field consultations

<sup>26</sup> Transformation of Aspirational Districts Program (TADP) aims at improving service delivery in LWE affected districts by ensuring convergence of Government initiatives of States and Centre, collaboration between different arms of Government and professional technical assistance.

Source: <https://niti.gov.in/about-aspirational-districts-programme>

<sup>27</sup> An employment cum rural public works [campaign](#) to empower and provide livelihood opportunities in areas/villages with a large number of returnee migrant workers affected by COVID-19 with an outlay of INR 50,000 crores.





and non-farm activities at the local level has become paramount.<sup>28</sup> Lack of income and cash liquidity will also negatively affect the upcoming agriculture season as farmers may find it difficult to buy inputs and services. Further, with weakening household income, access to quality, nutritious food could be drastically reduced, thereby impacting vulnerable segments of the community including women and children.

12. **To address these challenges, the Government of Chhattisgarh (GoCG) is promoting inclusive, resource-efficient rural growth with strengthened last-mile service delivery.** The state's vision charts an alternative model of development focused on rural growth leveraging natural resources, augmenting agriculture and allied sector-based multiple livelihoods, building resilience against climate shocks, and contributing to household nutrition security in remote tribal-dominated areas. The vision is reflected in three flagship schemes namely: (i) *Narwa, Garuwa, Ghuruwa, Baadi (NGGB)* under *Suraji Gaon Yojana* – rural transformation leveraging traditional knowledge on water conservation, livestock management, organic manure and backyard nutrition for resource-efficient growth; (ii) *GoDhan Nyay Yojana* – enhancing livestock farmers' income, promoting use of organic manure, improving soil fertility, availability of safe and nutritive food; and (ii) *Mukhyamantri Suposhan Abhiyaan*: provisioning of fresh, nutritious food to malnourished children and anemic women through *panchayats* and self-help groups (SHGs).

13. The NGGB policy promotes a sustainable and IFS approach focused on water management, integration of composting to build soil health, promotion of animal husbandry and sustainable agriculture on private and other lands. The policy is aligned with landscape approaches, conservation agriculture principles<sup>29</sup> and globally promoted IFS for sustainable development and offers opportunities for sustainable use of natural resources and IFS for year-round production of nutritive food for local consumption and wellness markets. The state government also provided land rights to 416,000 individuals and communities under the Forest Rights Act<sup>30</sup> which need to be supported with financial investments, inputs and extension services. With access to improved water management and other critical input support, the production systems in *baadi*<sup>31</sup> and Forest Rights Act lands could be developed to address local food and nutrition challenges and generate marketable surplus.

14. While NGGB will lead to accelerated and sustainable production of agriculture, horticulture, livestock, fisheries and agroforestry produce, Chhattisgarh's New Industrial Policy (2019-2024)<sup>32</sup> and recent initiatives<sup>33</sup> aim at promoting local aggregation and value addition by women and Scheduled Caste (SC)/ST entrepreneurs, and linking them with small and medium enterprises and food parks.

### C. Relevance to Higher Level Objectives

15. **The Project is fully aligned with the Bank's India Country Partnership Framework (CPF) FY 18-22** discussed at the Board on September 20, 2018 (Report No. 126667-IN) and contributes to CPF Pillar 1: Resource Efficient Growth, and Pillar 3: Investing in Human Capital. It specifically addresses **Objective 1.1:**

<sup>28</sup> <https://iw wage.org/wp-content/uploads/2020/06/Voices-from-the-Field-compressed.pdf>

<sup>29</sup> <http://www.fao.org/conservation-agriculture/en/>

<sup>30</sup> Per the Forest Rights Act provisions, tribal households living on and traditionally cultivating land before 2005 need to be given individual land rights. The Government has so far received 890,000 claims under this Act.

<sup>31</sup> Small garden developed by households on their own private land adjacent to their house.

<sup>32</sup> <https://industries.NRC.gov.in/pdf/policy2014-19/Industrial%20Policy%202014-19%20Translated%2012Feb2016.pdf>

<sup>33</sup> The GoCG has taken steps to brand its horticulture, forestry and handloom products (Produce of Chhattisgarh) and take them to national and international markets. An international buyer-seller meet led by the Chief Minister in November 2019 saw an impressive turn out with buyers from 17 countries and many Indian states participating and signing memoranda of understanding.



**Promote more resource-efficient, inclusive, and diversified growth in the rural sector** through CPF sub-objective indicators related to: (a) water use efficiency in agriculture (1.1.1); (b) additional land area where sustainable land management practices have been adopted (1.1.3); (c) increase in households with at least 50% increase in income (1.1.4); and (d) SHG households that have at least one additional source of income (1.1.5). The project also responds to **Objective 3.1: Enhance investment in early years of children's development** through the CPF sub-objective indicator on percentage of children aged 6-23 months receiving age-appropriate foods (3.1.1).

16. The project is aligned with the national objective of doubling farmer incomes, with the specific aim of facilitating inclusive development of tribal communities in Chhattisgarh's southern region. This approach supports and will contribute to Gol's Transformation of Aspirational Districts Program. The project is also aligned with the Gol initiative on forming and supporting Farmer Producer Organizations (FPOs) over the next five years.<sup>34</sup>

17. **The proposed project is well-positioned to contribute to India's National Action Plan on Climate Change and the State Action Plan on Climate Change.** The project design recognizes that ST communities must be partners in the strategy for natural resource conservation and sustainable land use, and to address the impact of climate change on communities.

18. **Impact of the COVID-19 pandemic on the country and government response.** In India, the pandemic and the national lockdown from March-May 2020 affected economic activity, with real GDP contracting by nearly 24% in Q1 FY21 (April-June 2020). Until mid-March 2020, India was impacted indirectly via trade channels, as key imported inputs to domestic production were impeded, supply chains were disrupted, and global trade slowed. As of March 25, the Gol implemented a country-wide lockdown to contain domestic contagion, and several states imposed additional curfew measures. As a result, economic activity, particularly industry and services, slowed sharply.

19. According to the World Bank's latest forecast, economic growth is expected to decline to -9.6% in FY21 and recover gradually thereafter. The financing needs of the Gol are expected to rise significantly. The sharp economic slowdown has affected revenues disproportionately (at central and state levels), with central government revenues declining by over 40% in the April-July period and states facing a shortfall of a similar magnitude. At the same time, expenditure needs have risen. As a result, the general government deficit is expected to rise above 12% in FY21 and public and publicly guaranteed debt to reach above 90%. The bulk of the required financing is expected to be sourced from domestic markets which for the moment have sufficient liquidity, with only a minor contribution from international borrowing.

20. The COVID-19 pandemic has exacerbated the vulnerabilities for traditionally excluded groups, such as youth and women. In addition, interstate migrants are at risk of increased poverty and destitution. Estimates from the Gol's Economic Survey highlight that the magnitude of India's inter-state labor migration was close to 9 million annually between 2011 and 2016 and migrant remittances in lower-income Indian states like Bihar accounted for 35.6% of gross state domestic product (GSDP) in 2011-12. Micro, small and medium enterprises (MSMEs) that account for the largest non-farm employment (30%)

<sup>34</sup> FPOs could be Farmer Producer Companies or Cooperatives as per local context and preference of the producers.

<sup>34</sup> In February 2020, the Central Government's Cabinet Committee on Economic Affairs has approved the formation and support for 10,000 FPOs between 2019-20 to 2023-24 to ensure economies of scale for farmers. <https://pib.gov.in/newsite/PrintRelease.aspx?relid=199421>



with about 20% female participation are considered to have been impacted the most due to lockdown.

21. **The GoI has unveiled a response package corresponding to 10% of GDP, including:**

- **Pradhan Mantri Garib Kalyan Yojana (PMGKY), to protect the poor and vulnerable impacted by Coronavirus Containment Measures**, expected to cost approximately \$23 billion.
- **MSME support** includes Emergency Credit Line Guarantee Scheme for INR. 3 trillion,<sup>35</sup> INR. 200 billion subordinate debt for stressed MSMEs, INR. 100 billion to provide equity funding for MSMEs with growth potential and change in the definition of MSMEs, by increasing investment limits and firm turnover, to help incentivize firms to grow.
- **Agriculture infrastructure fund** - proposed financing facility of INR. 1 trillion (funded by the National Bank for Agriculture and Rural Development) to promote postharvest management infrastructure and, **Micro-Food Enterprise** - INR. 100 billion for technical upgrade and promotion of clusters of local products.
- **Outlay of Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)** - a universal employment guarantee program, increased by INR. 400 billion.
- **Increased state government borrowing-limit**, from 3% to 5% of GSDP (added INR 4.28 trillion).
- **Long-Term Repo Operations (LTROs) and Special Liquidity Facility:** To alleviate cash flow pressures, the Reserve Bank of India has conducted LTROs and Targeted LTROs totaling INR 9.6 trillion (about 4.5% of GDP) since February 2020. Moreover, a Special Liquidity Facility for mutual funds of INR 500 billion was opened on April 27, 2020, to ease liquidity pressures on mutual funds.

22. **World Bank Group (WBG) support for responding to the crisis.** In alignment with its global response, the WBG has been closely supporting GoI's strategy, which consists of *three phases*. In the *first phase*, the GoI tackled health aspects, and partnered with the Bank to support a \$1 billion health project. In the *second phase*, GoI invested \$23 billion in a social protection program to support poor and vulnerable communities during lockdown, and the Bank provided financing of \$750 million. In the *third phase*, GoI focused on economic stabilization and reducing the costs of the lockdown. This includes support to MSMEs and their workers during lockdown, by committing about 1.5% of GDP to MSME finance. Bank financing of \$750 million is supporting this program to provide liquidity for their balance sheets, to mitigate against potential solvency problems and job losses, and to lay the foundation for a stronger MSME financing ecosystem in the recovery phase.

23. Additionally, the Bank activated the Contingent Emergency Response Component (CERC) in five projects to support the state governments' COVID-19 relief efforts. Moreover, many projects made special provisions for COVID-19 Assistance Packages within their project scope. Going forward, the Bank will be supporting the GoI under the following broad themes:

- (i) **Saving lives:** Other than the ongoing health programs, the Bank is a potential partner with GoI on its flagship program of *Atmanirbhar Swasth Bharat Yojna* which aims at strengthening the health sector in the country by strengthening healthcare services, health emergency preparedness and response and strengthen core capacities as per the International Health Regulations. In addition, the Bank is exploring innovative ways of support to the state and central governments through

<sup>35</sup> Details: <https://pib.gov.in/PressReleasePage.aspx?PRID=1625306>.



upcoming operations in the education (Andhra Pradesh, Gujarat) and health (Mizoram, Meghalaya) sectors.

- (ii) **Protecting poor and vulnerable people** The Bank will further support the efforts of the GoI under this pillar through the development policy lending II for social protection with a loan of \$250 million. This second phase of the social protection program is intended to enhance coordination across schemes and ministries to build a disaster-responsive social protection system and expand the ability of India's safety nets architecture to cater to diverse needs across states and vulnerable groups. Some upcoming projects have specific COVID-19 components supporting this pillar, such as Fisheries Sector COVID-19 Response and Recovery.
- (iii) **Sustainable growth and job creation:** The Bank is preparing a project on raising and accelerating MSME productivity which will focus on strengthening institutions and markets to enhance MSME productivity. Job creation is a special focus under the infrastructure projects as well.
- (iv) **Strengthening policies, institutions and investments for rebuilding better:** This is an all encompassing theme under India CPF and is integrated in most of the projects. The upcoming engagement with the National Disaster Management Agency on Seismic Risk Mitigation Project is one such example.

24. The IMF does not have an active lending program in India. However, it undertakes regular macroeconomic supervision and Article IV consultations twice yearly. The Bank and IMF teams regularly exchange views and information. Partnerships with other donors was brought to fruition in both the social protection and MSME COVID-19 response development policy operations (DPO). Under the social protection DPO, the Bank worked in collaboration with the Asian Development Bank (ADB), Agence Française de Développement (AFD), and Kreditanstalt fuer Wiederaufbau (KfW). The Japanese International Cooperation Agency (JICA), Asian Infrastructure Investment Bank (AIIB), the New Development Bank (NDB) and International Fund for Agriculture (IFAD) are also exploring potential parallel financing. In parallel, the ADB and JICA are exploring MSME sector support. Discussions are ongoing to expand the Bank's technical assistance through financing from the Bill and Melinda Gates Foundation (BMGF) and the United Kingdom's Foreign, Commonwealth and Development Office (FCDO).

## II. PROJECT DESCRIPTION

### A. Project Development Objective

25. **The project development objective (PDO)** is to improve income opportunities and the availability of nutritious foods in targeted households of Chhattisgarh's tribal-dominated areas.

26. **The PDO level indicators are:** (i) Beneficiary households with intensified and diversified sources of income (number, disaggregated by social category in percentage);<sup>36</sup> (ii) Beneficiary households with

<sup>36</sup> Increased intensity of income sources means a household has increased land farmed or input use to agriculture field crop production or horticulture, increased livestock herd size, increased aquaculture pond area, or increased collection of agroforestry commodities. Increased diversity of income sources means a household has diversified production either across or within LGs. Diversification across LGs is defined as engaging in at least one other agriculture or allied subsector (i.e. agriculture/field crop production, horticulture, livestock rearing, aquaculture,



increased number of food groups available (number, disaggregated by social category in percentage); (iii) Farmers reached with agriculture assets/services (core result indicator, number).

## B. Project Components

27. The Chhattisgarh Inclusive, Rural and Accelerated Agriculture Growth Project (CHIRAAG) is organized into six interlinked components including an emergency response component. A more detailed description of the project components is available in Annex 1.

**28. Component 1: Community Empowerment and Institutional Strengthening (\$14.9 million).** Household and community capacity will be built to: (a) plan, implement, and monitor development investments; (b) leverage community institutions and collective action toward effective management of natural resources, productive infrastructure and private assets; and (c) undertake nutrition-supportive agriculture, adopt diet diversity and promote positive nutrition practices at the household level.

**29. Subcomponent 1.1 Participatory Village Planning and Community Institution Building (\$12.3 million):** (a) awareness generation on the project among the targeted communities through village entry, communication and social activities that foster social capital development and rapport building; (b) support for preparation, diagnostic studies and implementation of village development plans (VDPs), through a participatory planning process; and (c) formation, capacity building and regular training of community institutions to participate in Project planning and implementation processes.

**30. Sub-component 1.2 Household Food Availability and Nutrition Practices (\$2.6 million):** (a) design and implementation of a social and behavior change communication program to increase knowledge and influence adoption of positive nutrition related practices by households, especially focusing on adolescent girls and women, including conducting formative research; developing program content, modules, training manuals and materials; developing toolkit for village level facilitation; and recruiting and training nutrition facilitators; and (b) support for need-based initiatives to empower communities to identify and manage malnourished children with the help of frontline workers.

**31. Component 2: Diversified, Resilient and Nutrition-Supportive Food and Agriculture Systems (\$48.5 million).** The component aims to sustainably develop and leverage natural resources as a foundation for developing more diverse, nutritive and productive food and agriculture systems that are more resilient to climate change. Sustainable use of natural resources for food, feed and energy requirements will help build household resilience to climate shocks while integrated food and agriculture systems will promote resource-efficient agriculture, diversify local livelihood options, increase the availability and diversity of food and agriculture commodities, as well as household food and nutrition security.

**32. Sub-component 2.1: Community-Based Natural Resource Management (\$19.6 million).** Support for development, management and sustainable utilization of natural resources, specifically water, soil and biodiversity, using traditional local knowledge, community-based management systems and modern technologies, including through: (a) investments in INRM, including land quality enhancement and rainwater harvesting activities; (b) investments in energy efficient water lifting and farm level irrigation

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agroforestry, or wage labor in a farm or non-farm sector). Diversification within LGs means an increase in crop diversification (measured as a decrease in the Herfindahl-Hirschman index, based on land area allocated to different crops), livestock reared, fish species cultured, or agroforestry commodities collected.



infrastructure; and grants to community institutions for financing soil nutrition management technology demonstration; and (c) design and delivery of soil health cards.

**33. Subcomponent 2.2: Integrated Food and Nutrition-Supportive Agriculture (\$28.9 million):** (a) grants to community institutions for financing investment in productive assets and adoption of climate smart technologies and practices as per VDPs, including backyard poultry, fishery, small ruminants, goat and pig breeding units, community nursery and poultry mother units; (b) support for investments in gravity drip irrigation and fencing for orchards and *baadis*; (c) support for infrastructure and capacity building at community level, including through: (i) training and capacity building of community resources persons and producers; (ii) demonstration of integrated farming systems and crop specific models; (iii) support for inputs for individual and community *baadi*; (iv) support for village level input production and trays/crates for artificial insemination; (v) support for community infrastructure at *gauthan* level for improved livestock feeding, manure management, storage, energy efficient tillage and farm operations; and (vi) fishery development; (d) capacity building at district and sub-district levels, including through: (i) support to Krishi Vigyan Kendras and government departments and agencies for establishing horticulture nurseries and upgrading department nurseries and brood hatcheries; and (ii) technical support for agro-forestry and biodiversity conservation, especially for local seeds and planting materials from village seed banks and use of drought-tolerant seeds; (e) capacity building at state level, including through: (i) capacity building of relevant departments for scaling up seed production of open pollinated varieties of pulses, millets, oilseeds and other underutilized tuber crops; and (ii) strengthening participation of agriculture universities to support seed production through supply of breeder seeds and revival of locally adapted seeds, demonstration of climate smart technologies and inputs, and preparation of economic and management models for *gauthans*.

**34. Component 3: Value Addition and Market Access (\$10.3 million).** This component aims to increase household incomes by promoting value addition, reduction in postharvest losses, and improved access to profitable markets (including wellness) for surplus produce. A focus on local processing will also improve household-level availability and consumption of nutritious food through: (a) promotion of safe food using preservation and energy efficient storage methods; (b) primary processing and value addition for local consumption and food waste reduction; (c) support to FPOs for aggregation, primary processing, value chain development of select commodities through public and private partnerships; and (d) upgrades to local rural market infrastructure and strengthening of community capacity.

**35. Subcomponent 3.1: Value Addition for Nutrition (\$1.0 million):** (a) support for village level energy efficient infrastructure for post-harvest, primary processing, packaging and storage; and (b) support for training nutri-entrepreneurs, including individuals and community groups, in value addition and energy efficient practices.

**36. Subcomponent 3.2: Value Addition and Market Access (\$9.3 million):** (a) establishment of a value chain development cell at the state level for undertaking value chain studies and identifying market opportunities for nutritive commodities, developing private sector partnerships, forming FPOs and building their capacity; provision of technical, financial and market access support to FPOs; and development of specific commodity value chains; (b) establishment of FPOs and their capacity building on climate smart value chain development and climate informed business plan development; (c) provision of grants to community institutions to support starting of business activities, creation of infrastructure, access to market and access to technology; and (d) investments for market support activities, including





certification, traceability, market intelligence, packaging, branding and promotion; and strengthening of select rural markets.

**37. Component 4: COVID-19 Economic Recovery Response (\$15.1 million).** Design and implementation of activities to restore livelihoods and support employment generation, including through provision of agriculture equipment, support for entrepreneurial activities, improvement of natural resources management and water availability, and increased awareness of COVID-19 precautions on safety and hygiene practices.

**38. Component 5: Project Management, Monitoring and Knowledge (\$11.2 million)**

**39. Sub-component 5.1: Project Monitoring and Management (\$10.7 million):** Support for project coordination, implementation, financial management, procurement, monitoring, evaluation and learning, and social and environmental safeguards/standards management at state, district and community levels.

**40. Sub-component 5.2: Knowledge Management and State Capacity (\$0.5 million):** (a) promotion of knowledge exchange through knowledge partnerships, events, conferences, bilateral meetings and workshops; (b) support for capturing, preserving and scaling up traditional knowledge and practices of tribal communities; and (c) supporting innovation at district level through strengthening of systems and processes, convergence, studies and events.

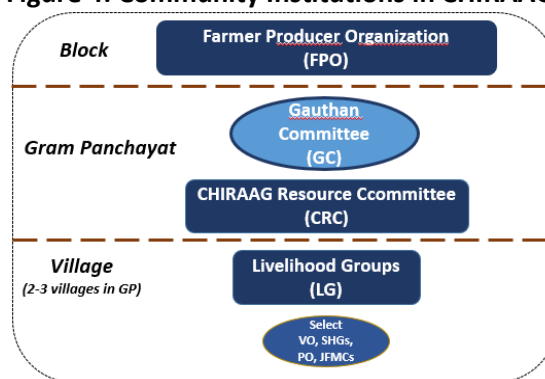
**41. Component 6: Contingent Emergency Response Component (\$0 million).** Provision of immediate response to an Eligible Crisis or Health Emergency.

### C. Project Beneficiaries

**42.** The project will be implemented across 14 blocks from 8 districts. Thirteen of the 14 targeted blocks are remotely located in the southern region of the state, with a high concentration of tribal communities. One block, with a higher SC population density, is from the central plains area.

**43.** The project will reach 180,000 households from about 1,000 villages. In each district, 1-2 blocks will be targeted. Within the 14 blocks, project villages will be selected and prioritized based on geographical remoteness, tribal population, and status of existing/proposed *gauthans*.<sup>37</sup> Within the selected villages, all households will be eligible to participate in project supported community institutions, planning and implementation processes and access project investments and benefits. Community institutions directly eligible to receive project benefits are *Gauthan* Committees, CHIRAAG Resource Committee

**Figure 4: Community Institutions in CHIRAAG**



<sup>37</sup> GoCG has so far identified 500 *gauthans*. The targeted 1,000 villages are yet to be identified.



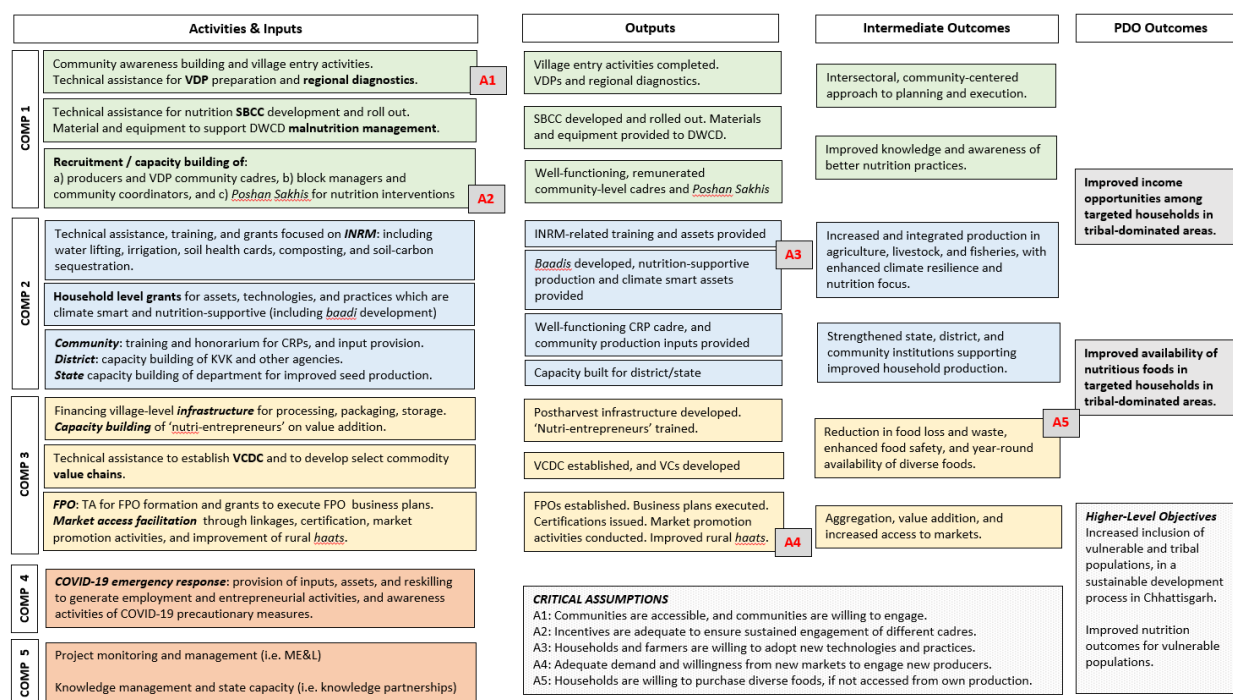
(CRC), livelihood groups (LGs), FPOs, select SHGs, village organizations, Joint Forest Management Committees and producer groups.

44. The agriculture department works largely with male farmers, mainly because land rights are in the name of male household members. The project, through championing nutrition-supportive agriculture, will facilitate the inclusion of more women household members in agriculture and allied support activities (extension, input provisioning, production and marketing decisions etc.) as well as support women members' ownership of assets (poultry birds, goats etc.), to strengthen their economic roles and recognized participation in agriculture.

45. The following GoCG line departments will benefit from state capacity building and knowledge partnerships with technical support agencies (TSAs): Agriculture Development and Farmer Welfare and Biotechnology (DoAB), Soil and Water Conservation, Horticulture, Livestock, Fisheries and the Chhattisgarh State Seed and Agriculture Development Corporation Limited (*Beej Nigam*).

46. Indirect beneficiaries of the project are: (a) local private sector, processors and exporters; and (b) national and global value chain actors.

## D. Results Chain



## E. Rationale for Bank Involvement and Role of Partners

47. The Bank has considerable global experience in resource-efficient, inclusive, and diversified growth





in the rural sector. With investments in similar projects in India,<sup>38</sup> Pakistan, Nepal, Sri Lanka and Bangladesh over the past two decades, the Bank's knowledge base, operational experience and lessons have informed the project design. Lessons in "scaling up" from other countries have been incorporated, and in keeping with the Lighthouse India approach to state-state learning, implementation and institutional partnerships with projects in India, as well as across the region, will be established for south-south knowledge exchange through technical assistance and exposure visits to other states, countries and regions (e.g. South East Asia, Latin America, China).

**48. Linkages with other projects and sectors.** As the core partner shepherding an inclusive development pathway for tribal community growth and development, the Bank will facilitate project linkages to the broader program, and other IBRD/IDA supporting projects. The Bank team will engage with global practices for health, nutrition and population and social development and labor to enable convergent action across projects specifically related to nutrition-supportive agriculture, inclusive rural development, resilient livelihood development and access to markets.

**49. Linkages with other development partners.** GoCG is engaging with IFAD to expand CHIRAAG interventions to other parts of the state, strategically bolstering development outcomes. In technical collaboration with the Bank, IFAD is preparing a separate project focused on northern Chhattisgarh, largely following CHIRAAG's design and approach. This complementary investment from IFAD, with strategic collaborative arrangements for bringing in global best practice and knowledge will contribute to the state's effort for a focused inclusive development agenda for the poorest of the poor. Technical support from development partners like the Bill and Melinda Gates Foundation (BMGF) and other bilateral and multi-lateral development agencies operational in the country will also be sought.

**50. Linkages with agricultural research organizations.** The Bank through its convening ability will facilitate partnership development with relevant national/international organizations i.e. the Food and Agriculture Organization of the United Nations, International Crop Research Institute for Semi-Arid Tropics, Biodiversity International, Central Food Technology Research Institute, etc.

**51.** The expected roles of partner agencies are as follows:

- (a) **Other line departments.** Close coordination and collaboration will be maintained with all relevant GoI and GoCG programs and interventions of other ministries/departments supporting socio-economic empowerment of communities. This will bring complementarity in approach, avoid duplication of effort and facilitate communities' access to multiple interventions and services.
- (b) **Private sector agencies.** For access to profitable markets (component 3), the project will support the fostering of partnerships with select private sector organizations and aim to maximize finance for development to draw upon complementary value chain investments from partnering firms in key commodities. Following Latin American productive alliance models,<sup>39</sup> FPOs will be linked to local processors and export firms, major national agribusiness players and organized retailers,

<sup>38</sup> For example, the Andhra Pradesh Rural Inclusive Growth Project, National Rural Livelihoods Project, Bihar Transformative Development Project etc.

<sup>39</sup> Paulo de Silva, Carmine. *Productive Alliances in Latin America and the Caribbean*. Collaborative arrangement between a small producer organization and an agribusiness firm, aiming at reducing technical, commercial, financial and/or social risks associated with its pursuit of potential income gains.



including International Finance Corporation investee clients. The project will aim to access national/global wellness markets for tribal products and seek International Finance Corporation advisory and facilitation support on strategic private sector investments in the state. Partnering private sector firms will be expected to invest, develop supply chains and create job opportunities.

- (c) **Technical Support Agencies.** To strengthen the technical capabilities of key directorates, the services of high-quality TSAs will be sourced under various project components. The TSAs will work with project counterparts in tandem and equally share implementation responsibilities i.e. assessments, guideline preparation, framework and knowledge support etc.

## F. Lessons Learned and Reflected in the Project Design

52. The project design reflects lessons from inclusive livelihood, tribal development initiatives, CSA and successful nutrition-supportive agriculture interventions in India and globally. Lessons from Chhattisgarh and the state's experience that guided the project design include:

53. **Leveraging bottom-up participatory processes and community-based organizations, are key to tribal empowerment and sustainability of project interventions.** A flexible, non-prescriptive, process-oriented, demand side approach is critical to enable stakeholders to determine the scope of program activities, their timing, pace and sequencing. The promotion of IFS around multiple livelihoods for systematic utilization of natural resources and initiatives to increase agricultural production, as well as support broader policy initiatives that fall under the ambit of tribal *panchayats* will help to foster tribal empowerment and ensure sustainability.

54. **Livelihood diversification and sharper targeting of specific socioeconomic groups are a key strategic approach to augment income and build resilience of tribal groups.**<sup>40</sup> Diversification, harnessing underlying natural resource wealth, can increase incomes of participating tribal households. Diversification aimed at enhancing the basket of livelihood sources and complemented by provision of better infrastructure and capacity development support helps tribal households to increase income. Diversified production systems also build resilience against climate shocks in economically remunerative sub-sectors (agriculture, horticulture livestock, fisheries, sericulture, and agroforestry). A focus on the heterogeneities among indigenous people and the need for appropriate development strategies to meet the respective needs of target groups is a critical part of the targeting approach.

55. **Nutrition-sensitive agriculture programs have the potential to improve household nutrition, availability and dietary diversity.** A recent analysis of nutrition-sensitive agriculture across 19 African, Asian, Latin American and the Caribbean countries highlights the importance of developing context-specific activities; targeting social and behavior change communication (SBCC) activities along all agriculture-nutrition pathways; empowering women; focusing on opportunities for nutrition throughout value chains; strengthening coordination and collaboration; and investing strategically in partnerships and capacity building to ensure sustainability. These lessons have been taken into consideration in designing the project, to maximize the potential of nutrition-agriculture linkages for impact.

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<sup>40</sup> Impact Assessment Report, Jharkhand-Chhattisgarh Tribal Development Program, Independent Evaluation Office, IFAD.



56. **Livelihood interventions need to factor in spatial and seasonal dynamics, livelihood resource base, viable investment per household and productive infrastructure at the project design stage.** A calibrated approach has been adopted in the project design ensuring equal focus on technical and value chain interventions to enhance agriculture competitiveness and resiliency, as well as community-based approaches to ensure inclusion of poor households. Further, the project emphasizes use of spatial analytics to locate project interventions in blocks (geographical clusters) that have the strongest potential for income impacts where enabling conditions already exist or can be achieved through planned government investments (such as access to irrigation and profitable markets).

57. **Social inclusion, community participation and transparency are key strategies, especially in LWE areas.** Lessons learned from a range of rural livelihood initiatives in Chhattisgarh demonstrate that to avoid exacerbating the LWE situation, it is important to ensure that projects: (a) include the poor, women and tribal community members in all aspects of implementation; (b) are relatively small in scale/have low visibility; (c) utilize local community members in project implementation; (d) are highly transparent with respect to targeting and finances; and (e) train and orient project staff on how to effectively operate in LWE-affected areas.

### III. IMPLEMENTATION ARRANGEMENTS

#### A. Institutional and Implementation Arrangements

58. GoCG's DoAB is the project implementation agency and nodal department for overall management and implementation. Under the aegis of DoAB, Directorates of Agriculture, Horticulture, Fisheries and Veterinary Services will support the project at various implementation levels. *Beej Nigam* will act as the project implementation agency for additional procurement services and undertake specific seed production sub-projects. See Annex 2 for detailed institutional and implementation arrangements.

(a) A high-level **Project Advisory Committee (PAC)**, chaired by the Chief Secretary will provide overall project oversight and policy guidance. A **Project Steering Committee** chaired by the Agriculture Production Commissioner will be responsible for approving and reviewing project annual budgets, work plans, physical and financial progress, and driving inter-departmental coordination and convergence. Project Steering Committee members will include the Agriculture Production Commissioner, DoAB Secretary, and Directors of Agriculture, Horticulture, Veterinary Services, Fisheries and relevant department/agencies, i.e. Rural Development, State Rural Livelihood Mission (SRLM),<sup>41</sup> Women and Child Development, Tribal, Forest and *Beej Nigam*.

(b) **DoAB** will have overall responsibility for coordinating other agencies in the preparation of reports, annual work programs, budgets and procurement plans, reviewing and overseeing review meetings. DoAB will set up a **State Project Management Unit (SPMU)**, drawing officers from the Directorates of Agriculture, Horticulture, Livestock and Fisheries and engaging short-term consultants and technical service providers. The SPMU will be headed by a Project Director and supported by a Chief Operating Officer. The SPMU will have thematic specialists including experts on environmental management and social standards, financial management (FM), procurement, human resources and administration

<sup>41</sup> Called BIHAAN locally.



activities. Multiple TSAs will be engaged to provide key technical support and backstopping needed for various project components. DoAB will assume direct responsibility for day-to-day project management, procurement consistency and compliance, coordination, oversight and monitoring, and implementation of project components.

(c) In targeted project districts, **District Project Management Units (DPMU)**, each under the direct supervision of a District Project Manager, supported by six coordinators selected from the market for major thematic areas, will monitor and implement the project. Deputy Directors for Agriculture, Horticulture, Fisheries and Veterinary Services along with the Assistant Soil Conservation Officer will provide technical and implementation guidance to DPMUs on a day-to-day basis. The project will also be reviewed by the District Collector in regular monthly district review meetings ensuring that the Project activities are included in the district development plans.

(d) At the block level, **Block Project Implementation Units (BPIUs)** will carry out day-to-day implementation and management of project activities, each supported by a Block Project Manager along with a team of 12 officers i.e., coordinator (markets & value chain), and cluster coordinators. This 12-member block team will play a critical role in project implementation. Supported by TSAs, the teams' capacity will be strengthened to ensure high-quality implementation.

(e) At the *Gram Panchayat (GP)* level, *Gauthan* Committees will be involved in facilitating village entry, VDPs and convergence. Under *Gauthan* Committees, a dedicated CRC<sup>42</sup> will be formed to anchor project interventions and provide support for implementation and monitoring. At the village level, multi-commodity LGs will be formed for mobilizing interested producer households to improve their livelihood activities related to farming and allied sectors. The LGs will be consolidated into FPOs for improved postharvest management, value addition and market linkages. Spearhead teams will support the mobilization and capacity building of the above institutions, as well as provide extension and advisory services to producers. Spearhead teams will be managed and supervised by BPIUs. The project will provide on-the-job training to field level staff and community resource persons, noting their crucial role in anchoring last mile project implementation.

(f) DoAB has prepared a Project Implementation Plan (PIP) that provides the complete technical, operational and financial details of CHIRAAG, including project components, eligible activities and processes, mechanisms for planning, implementation, fiduciary management, Environment and Social Framework and monitoring and evaluation. The field level arrangements and processes will be described in the Community Operations Manual (COM). The project will also prepare a separate manual to guide the implementation of the activities under COVID-19 Economic Recovery Response component.

(g) **Collaboration with IFAD:** The GoCG is in discussion with IFAD on a project in Northern Chhattisgarh following the overall design of the Bank-funded CHIRAAG project. To ensure alignment of project interventions and development outcomes the GoCG, IFAD and World Bank have reached a common understanding that both projects will be implemented through a single SPMU. Contingent upon GoCG's agreement on the IFAD project, IFAD financing will partially support the SPMU.

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<sup>42</sup> CRCs will have 8-20 members drawn from *Gauthan* Committees, LGs and select community institutions.



## **B. Results Monitoring and Evaluation Arrangements**

59. The monitoring, evaluation and learning system will function both as a decision support system and a social observatory. The objectives of the monitoring, evaluation and learning system include tracking and measurement of inputs, activities and outputs, assessing the processes of implementation, verifying project-related assumptions, evaluating project outcomes and impacts, and assessing achievements against project objectives. The system will include primary stakeholders and involve community-based participatory monitoring and learning. It will facilitate regular management review and adaptation in the form of monthly review meetings and quarterly thematic meetings. An information and communications technology (ICT)-enabled customized management information system (MIS) and geographic information system-based input-output monitoring system will generate monthly progress reports. Baseline survey data will be collected in the first year, midline data in the third year, and end-line data in the sixth year. The series of survey data would be the basis for rigorous project evaluation.

60. The midterm review of the project will be completed by the fourth year of the project. The review will assess progress and re-evaluate the adequacy of the results framework. Under process monitoring, a separate set of rapid assessments will be conducted, focused on monitoring and articulating results under Component 4 activities. These rapid assessments will be conducted during the first 18 to 24 months of the project using baseline and MIS information. An SPMU monitoring, evaluation and learning team will oversee all monitoring, evaluation and learning activities with coordinators at district, block, and community levels, and with the support of a set of TSAs.

## **C. Sustainability**

61. **Technical sustainability** of the project will include but is not limited to human capital development addressing malnutrition, and agriculture (80% of total state farmers are small and marginal). The project design aims for improvements in nutritional security among the poorest, mainly tribal communities, through sustainable and climate resilient production systems with efficient use of natural resources including water, soil, biodiversity and animal husbandry, and development of community institutions to promote value addition and market access. Human capital development areas primarily include nutrition, for increased availability of nutritious food; INRM and in field water management for resilient production systems resulting in drought proof production systems; increased availability of improved inputs and climate smart technologies and improvements in farmer's adaptive capacity for scaling up diversified livelihoods, resulting in increased production of nutritive products; and increases in farm gate prices, volume and value of marketed agricultural output thus ensuring enhanced income, food and nutrition security. The state is also committed to contributing and will support the sustainability of these activities by allocating required resources to keep beneficiaries fully engaged.

62. **Institutional sustainability** will be supported through the mainstreaming and strengthening capacities of various line departments (agriculture, horticulture, veterinary services, fishery) and improving their delivery systems through strengthened MIS and related processes. State infrastructure and capacity will be proactively strengthened for improved service delivery in agriculture and allied sectors. The state government and line departments will be an integral part of all project activities. Project implementation will be anchored within the GoCG departments and agencies, giving them full responsibility for project implementation and management, thereby not only improving public sector service delivery, but also building capacity and experience within departments and agencies, as well as



integrating a culture of directly engaging with farmers and beneficiaries in remote project areas, including LWE-impacted areas.

**63. Financial sustainability:** The project aims to empower targeted communities and build human capital to: (a) improve capacity to manage natural resources and production systems; (b) acquire new knowledge and skills for nutrition-supportive, resilient production systems; and (c) access profitable markets through aggregation, value addition, skills and knowledge. Project investments in water management infrastructure, scaling and deepening multiple livelihoods, new community institutions (LGs, *gaouthan*, CRCs), organizing farmers into FPOs, and improved producer-market links would enhance the financial sustainability of the targeted producer households and instill confidence in potential private sector investors in select sectors (i.e. agriculture, horticulture, livestock and fishery), including International Finance Corporation investee companies. Stakeholder capacity, particularly the capacity of state, district and block level officials of participating departments, will be strengthened, thus ensuring financial sustainability of project activities. The project will benefit from the GoCG and Gol's strong commitment to fostering agriculture development through sustainable growth, food and nutrition security, food safety and focus on nutritive food commodities, household income and shifting focus beyond farming towards postharvest value addition, processing and access to profitable markets.

**64. Social and environmental sustainability.** Project interventions will promote overall sustainable and efficient utilization of natural resources for optimal productive use and building community resilience against climate shocks. IFS activities (agriculture, horticulture, livestock, fisheries, agroforestry, value addition, and marketing activities) will augment year-round local availability of nutritive foods thus benefitting households in villages including women, tribal, youth, landless, and other vulnerable groups on nutritional and income outcomes. Any minimal environmental or social risk and impact arising from project interventions will be mitigated and managed through measures outlined in the Environment and Social Management Framework (ESMF) and the Environment and Social Commitment Plan (ESCP).

#### IV. PROJECT APPRAISAL SUMMARY

##### A. Technical, Economic and Financial Analysis

**65. Project benefits.** The main project benefits include: (a) increased/enhanced sources of income for targeted beneficiaries, (b) resilient production systems adapted to climate change; (c) streamlined production input systems; (d) increased availability of nutritious foods; and (e) improved access to local and distant markets. The project design effectively leverages agriculture-nutrition pathways to maximize the potential for improved nutrition outcomes in project areas. Given the state's alarming nutrition challenges and the population's large dependency on agriculture, the sector remains an important platform for impacting the most vulnerable sections of the population and the agents – women caregivers in particular – most crucial for change. Specifically, these benefits will result from: (i) investment in water harvesting structures and irrigation facilities; (ii) nutrition-supportive climate resilient production systems; (iii) adoption of climate smart production technologies and practices; and (iv) improved postharvest management, value-addition and marketing of commodities in profitable distant markets, and improved household diets and availability of nutritious foods. It is expected that substantial employment will be generated due to the increased area under crop production and resulting opportunities for own and on-





farm labor, particularly for the landless poor who are mainly employed in agriculture as wage workers, and increased employment in handling, processing and marketing of incremental production.

**66. Economic viability and sensitivity analysis.** The project's economic internal rate of return (EIRR) over a 20-year period for the base case, excluding benefits from greenhouse gas (GHG) emission reduction, is 23.5% with a net present value of \$72.8 million at a discount rate of 12%. A sensitivity analysis was conducted to assess the impact of changes in main parameters affecting the economic outcome of the project as a result of: (a) changes in project costs; (b) changes in the expected benefits from the production systems promoted by the project (crop, livestock, fisheries and minor forest produce); and (c) delays in project execution due to risks identified in the risk analysis. Results show that the project remains economically viable even within adverse changes in project costs and benefits. A reduction in project benefits by 20% results in an EIRR of 18.2%. A 20% increase in project costs combined with a 20% reduction in project benefits, coupled with a two-year delay of benefits, reduces the EIRR to 10.1%. Further details are provided in Annex 5.

**67. Financial analysis** has been carried out for the main productive activities supported by the project. Detailed crop budgets were prepared for major agricultural and horticultural crops for typical smallholder plot sizes, providing an overview of the production system including key production parameters, farmer organizations, investments and marketing channels. Similar analyses were prepared for livestock production models (goats, pigs and poultry) and fish production systems (small and large ponds). The results show considerable increase in gross margin, net profit, and return to family and total labor for all production systems. The financial analysis suggests that an increase in average real annual household income of targeted households is possible due to diversified or intensified economic activities promoted by the project. Table 4 in Annex 5 shows the estimated incremental annual net income per household, as well as the initial investment costs and the incremental annual costs of intermediate inputs (variable costs) for the main productive activities supported by the project. It is expected that the financial analysis will be periodically updated as an integral part of the project's monitoring and evaluation system, and as an input into the project evaluation at midterm and completion stages.

**68. Climate co-benefits.** Chhattisgarh is a critical climate hot spot in India, rendering the project area and targeted communities extremely vulnerable to climate shocks. Project investment areas support accelerated adoption of climate resilient activities, notably an IFS that includes CSA practices (i.e. drought resistant seeds/planting materials, conservation of local biodiversity/germplasm, improved land management practices, energy efficient tillage to prevent top-soil loss, soil health card and soil carbon enhancement with increased use of composting, improved manure management, biodigesters at community level, reduction in chemical fertilizers/inputs, rain water harvesting and run off management thus preventing soil erosion, energy efficient irrigation, rehabilitation of degraded lands through agro-forestry, orchard development, livestock management with improved feeding practices for reduced methane emission, resource efficient fisheries with low external inputs and improved management practices, and renewable energy-based postharvest/processing/storage to reduce food wastage). The comprehensive range of project activities including intensive community capacity building measures and institutional support, will help strengthen the resilience of about 180,000 smallholder farmer households, and support them to adapt to negative impacts of climate change.

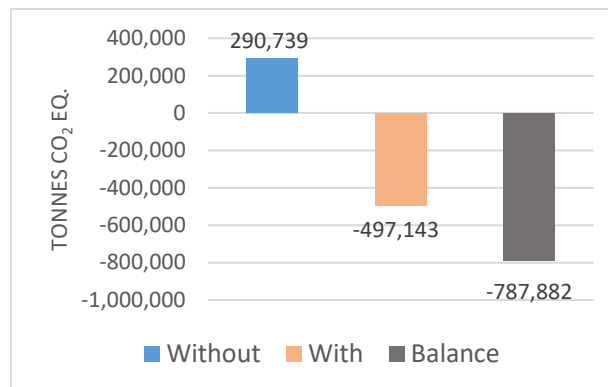


69. As described in the economic and financial analysis, the project contributes to moderately reduce GHG emissions from resource efficient production systems including livestock. However, other climate mitigation co-benefits that are not quantified might reduce GHG emissions, such as reduction in seed and fertilizer use, improved manure management, adoption of CSA practices, increased efficiency in value chain processes (e.g. solar pumps, cold storage); and potential reduced use of fuel for transport in selected value chains. Refer to Annex 6 for more details.

#### 70. GHG emissions reduction and shadow price of carbon.

The net balance of all GHG (expressed in CO<sub>2</sub>-equivalent) that would be emitted or sequestered within the potential project activities was estimated and accounted in the economic analysis using the social price of carbon. The economic and financial analysis uses a low and high estimate of the carbon price starting at \$40 and \$80, respectively, in 2020 and increasing to \$50 and \$100 by 2030. According to the calculations in EX-ACT, the project showed a total reduction over the project lifetime of 787,882 tons of CO<sub>2</sub>-equivalent, which means that the project will have a positive carbon sequestration balance (Graph 1). Given the moderate GHG emissions reductions, the overall carbon benefit is estimated to range between \$10.7 million in the low shadow price of carbon scenario and \$21.4 million in the high scenario. Incorporation of this relatively small benefit into the economic analysis improves the project EIRR to 25.1% in the low scenario and 26.8% in the high scenario.

Graph 1: Total Balance 'without' and 'with' project



## B. Fiduciary

### Financial Management (FM)

71. FM arrangements reflect lessons learned from the ongoing Chhattisgarh Public Financial Management and Accountability Program (P166578) and other Bank agriculture sector operations in Odisha, Jharkhand, Maharashtra and Andhra Pradesh, and are adapted to CHIRAAG specificities. Project FM arrangements will be mainstreamed into the state's planning and budgeting processes; and e-Kosh (state's online treasury management system) and PFMS (GoI's Public FM System) will be used for allocation of project funds, application of internal checks and controls, accounting and financial reporting and tracking of project unspent bank balances. Several supplemental measures have been agreed to mitigate the identified risk of disbursement lag arising from delays in accounting for expenses incurred at field level. Based on the Bank's assessment, proposed FM arrangements are acceptable, and provide reasonable assurance that loan proceeds will be used for intended purposes and properly accounted. With agreed supplemental measures in place, the residual FM risk is rated **Moderate**.

72. The supplemental measures agreed include: (a) use of PFMS to provide last mile visibility of bank account balances, fund transfers, and fund utilization across the project; (b) hiring and retention throughout the life of the project, of suitably qualified FM staff at the SPMU and DPMU in the Directorate of Agriculture; (c) agreement on a robust operational framework and protocol for funding of selected sub-





projects and business plans at the community level; and (d) agreement on protocol for sharing of common costs with other financing partners. The Community Operational Manual will provide detailed guidance to field staff on processes of selection of beneficiaries, eligibility criteria, form and content of the business plan, including the funding sources for the productive investments and its operation and maintenance, cost sharing norms, applicable procurement arrangements, fund flow and appraisal/approval work flows. See Annex 3 for detailed FM and disbursement arrangements.

## Procurement

73. All goods, works, consulting and non-consulting services financed under the project will be procured in accordance with the World Bank's Procurement Regulations for IPF Borrowers (dated July 2016; revised November 2017 and August 2018), and the provisions of the Financing Agreement. If there is conflict between government decrees, rules, and regulations and Bank Procurement Regulations, the Bank's Procurement Regulations shall prevail. The project will be subject to World Bank Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants ("Anti-Corruption Guidelines"), dated October 15, 2006 and revised in January 2011 and as of July 1, 2016.

74. *Implementation arrangements for procurement.* As the nodal agency, the SPMU will have overall responsibility for ensuring procurement compliance and consistency, as per agreed processes and procedures. Moreover, *Beej Nigam*, a wholly owned GoCG unit, will carry out specialized open market procurement for activities identified and prior agreed with the SPMU. The project shall not fund any seeds produced by *Beej Nigam* either on its own or on farmer's fields. SPMU and *Beej Nigam* will be carrying out all project procurement activities, except those to be carried out at district and community levels.

75. The overall Project activities to be carried out under the project are not envisaged to exceed the national competitive bidding (NCB) threshold. A detailed list of key activities at SPMU, DPMU and Community levels shall be included as part of Project Procurement Strategy for Development (PPSD).

76. *Procurement Risk Assessment, mitigation measures and rating:* The assessments of procurement capacity and risk suggest *Beej Nigam* has been largely responsible for most state-funded procurement activities, whereas DoAB has been engaged in some. DoAB and *Beej Nigam* procurement staff do not have experience in handling procurement under Bank procurement regulations. The following potential procurement risks have been identified: (a) absence of procurement planning; (b) limited capacity resulting in delays in procurement and contract management; (c) noncompliance with agreed procurement arrangements; (d) internal delays in decision making due to bureaucratic processes; (e) need for enhanced transparency and robust complaint redressal mechanism; (f) no formally planned procurement reviews being undertaken; and (g) absence of regular oversight mechanism for procurement and contract management aspects. Overall procurement capacity is weak, and considering the geographical spread, highly decentralized nature of the project and complexity of some activities, the overall project risk rating is **High**. Based on discussions with the implementing agencies, measures to mitigate the risks have been identified and the residual risk rating following implementation of mitigation measures is considered **Substantial**. The mitigation measures are further elaborated in Annex 3.

77. *Project Procurement Strategy for Development (PPSD):* DoAB has prepared a PPCSD. Past procurement and vast experience regarding most of the proposed activities indicate that the state is familiar with the vendor market which is reflected in the PPCSD for all major activities. Based on the agreed cost tables, the



PPSD defines the envisaged activities, estimated cost, method of procurement and Bank review requirements. The document describes how economic, efficient and transparent procurement shall be carried out for smooth execution of the project. The PSD duly captures the market and vendor availability, unique nature of some of the agricultural inputs, need for involvement of specialized government-owned organizations and specialized non-governmental organizations (NGOs), current procurement arrangements, market conditions and limitations.

### C. Legal Operational Policies

	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

### D. Environmental and Social

78. **ESS1: Assessment and Management of Environment and Social Risks and Impacts.** Per the Environmental and Social Framework, GoCG carried out an Environmental and Social Assessment based on a desk review of relevant documents and stakeholder consultations across three agro-climatic zone to identify and assess the environmental and social risks and impacts related to project interventions. Based on the Environmental and Social Assessment, an ESMF was prepared and disclosed that lays down processes to screen, identify, assess, mitigate and minimize any risk and adverse impact to the community. The ESMF is applicable to all components and outlines the implementation, monitoring and reporting arrangements with capacity building requirements. It contains a negative list of activities that will not be supported under the project. The GoCG's ESCP, which includes sub-project-specific safeguards documents that will be prepared post-effectiveness, was agreed with the Bank and disclosed. Implementation arrangements include appointment of SPMU Social and Environmental Specialists, and Environmental and Social Officers at district and block levels. Quarterly monitoring reports on ESCP and ESMF implementation will be submitted by the SPMU to the Bank. Environmental and Social Audits will be conducted at the midterm and end of project.

79. **ESS2: Labor and Working Conditions.** Several small-scale contracts will be executed through local contractors using mostly local labor and community workers, therefore the risk of gender-based violence, child/bonded labor, and hazardous work and/or accidents is assessed as low. To address any potential labor risks and impacts, labor management procedures proportional to project risks will be prepared by the Department of Agriculture based on the labor management framework prepared as part of the ESMF. A sub-project specific Labor Management Plan will be prepared prior to the bidding process.

80. **ESS3: Resource Efficiency and Pollution Prevention Management.** Proposed diversification and intensification of production systems could lead to increased pesticide and fertilizer use. To mitigate this risk, preparation of a Pest Management Plan and a Nutrient Management Plan was agreed in the ESCP with a defined timeline, template and budget. The Pest Management Plan and Nutrient Management Plan shall cover capacity building measures and training on integrated pest and nutrient management; safe usage, storage and disposal of pesticides and other agrochemicals. Any pollution and waste generation issues arising from small scale construction activities, pond aquaculture, livestock activities, food



processing and value addition activities will be addressed through a site specific Environmental and Social Management Plan, guidelines and capacity building. GHG emissions estimation and resource efficiency analyses are included as parts of value chain interventions. CSA practices will also be promoted.

**81. ESS5: Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement.** Project interventions will not require private lands, cause involuntary resettlement or physical relocation. Land parcels with encumbrances will not be considered under the project. Hence ESS 5 is not relevant.

**82. ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.** Around 44% of Chhattisgarh's land area is under forest, with over 625 minor forest produce species (more than 200 species of medicinal, aromatic and dye plants). The project will not support any interventions in production of minor forest produce in critical natural habitats and other reserve forests, thereby eliminating the risk of altering species composition, chance introduction of invasive species and disturbance to ecosystem services. Project interventions will include value addition support for minor forest produce grown outside the forests only (village common lands or *baadi*) by way of small primary processing at the household or community level – grading, sorting and packaging – and linkages to markets to increase the income from this trade. To mitigate any indirect and unintentional adverse impacts, a Biodiversity Management Plan has been agreed in the ESCP with an explicit focus on monitoring the extractions and collections of minor forest produce, both from inside and outside the forests for ensuring that the proposed investments do not lead to increased risk of biodiversity loss through minor forest produce extraction. Project interventions on aquaculture may lead to risk of disease outbreaks or escape of invasive species into the wild, affecting the biodiversity. To address the risks, a guideline on good aquaculture practices and management plan will be developed including implementation, monitoring and capacity building measures. An agreement to this effect has been made in the ESCP with budget and timeline for preparation.

**83. ESS7 Indigenous Peoples.** During the Environmental and Social Assessment, focused consultations were held with indigenous communities and particularly vulnerable tribal groups. The project will ensure identification, targeting and inclusion of key vulnerable groups in the village planning exercise, beneficiary selection for individual and group assets, formation of beneficiary groups, livelihood support interventions, dedicated consultations and identification of special measures for vulnerable households.

**84.** Project interventions will not cause any adverse impacts on the lands, livelihoods, resources, and cultural properties of tribal communities. A Tribal Development Framework<sup>43</sup> has been prepared that provides for specific measures to ensure socially and culturally compatible project interventions that enjoy broad community support in the tribal villages. A sub-project-specific tribal development plan will be prepared once sub-projects are identified and finalized.

**85. ESS8 Cultural Heritage.** Project areas are likely to have several pilgrimage sites and places of religious prominence, sacred groves and sacred water sources. The risk of impact on cultural heritage is mitigated through a Chance Find Procedure which has been prepared as part of the ESMF. A Cultural Heritage Management Plan will be developed as part of the site-specific Environmental and Social Impact Assessment/Environmental and Social Management Plan to address any risks or impacts on tangible and

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<sup>43</sup> Indigenous Peoples Planning Framework (IPPF).



intangible cultural heritage or encounter with previously unknown cultural heritage during the project. An agreement to this effect has been included in the ESCP.

**86. ESS10 Stakeholder Engagement.** As part of the Environmental and Social Assessment, the GoCG Department of Agriculture held stakeholder consultations, focusing on primary stakeholders and main project beneficiaries, including farmers, women's groups, and *GP* leaders, as well as disadvantaged and vulnerable groups, such as marginal farmers, landless households and agricultural laborers, SC and ST households, and particularly vulnerable tribal groups. Special consultations were also held in economically disadvantaged *GPs*, tribal villages, and with elected leaders and officials of the *GPs* and line agencies. The project stakeholder engagement plan includes multiple channels of communication and engagement with project stakeholders throughout the life of the project. The stakeholder engagement plan also includes set up of an accessible and inclusive grievance redress mechanism to be rolled out in project villages.

**87. Gender.** In Chhattisgarh, women are the primary agricultural workers, and play a major role in the collection and processing of food and medicinal plants. Through the Gender Action Plan, women farmers/landowners, workers, women-headed households, and community leaders will be systematically identified and included in the *GP* Resource Management Plans, beneficiary group leadership, training programs, sub-project investment planning, and beneficiary lists. The existing cadre of largely women social mobilizers will be provided additional training to implement dedicated interventions for women and special vulnerable groups. Despite their role in agriculture, women face multiple barriers, which are social and cultural in nature, limiting their access to new practices, technological advancement, market opportunities and taking up leadership positions in the community thereby preventing their access and control of resources. A gender framework has been prepared as a part of Environmental and Social Impact Assessment which specifically tries to address issues at the planning and implementation stage of the project. Concerted effort will be made by DPMUs and BPIUs to engage women in activities in which they feel confident and possess unique capabilities such as livestock management, primary processing and build their capacity in resilient technologies and practices, particularly focusing on reduction of drudgery.

**88. Gender Based Violence (GBV).** As a part of the ESMF preparation process and based on stakeholder consultations and GBV risk assessment tool, the project GBV risk rating is **Low**. The scale of activities and associated impacts are likely to be localized and hence GBV risk mitigation measures are built into the occupational health and safety aspects of labor management and sensitization of communities.

**89.** To mitigate potential risks related to on-site safety and GBV, the SPMU will: (a) conduct regular sensitization and awareness drives for community laborers, contract laborers (if applicable) and communities on safety, harassment, GBV-related issues, legal recourse procedures and mitigation channels in collaboration with the police and health departments; (b) hire a gender expert; (c) sensitize the SPMU social expert on specific aspects of GBV risk mitigation; (d) strengthen the grievance redress mechanism by establishing multiple channels to initiate a complaint including confidential reporting in the local language with safe and ethical documentation of GBV cases; (e) identify and engage efficiently with community-based organizations and GBV service providers in the project area to ensure a strong support mechanism; and (f) ensure bidding documents include a code of conduct in line with GBV requirements.

**90. Citizen Engagement.** The purpose of citizen engagement is to present and share project information and activities with stakeholders, seek inputs, and build relationships with communities. Citizen engagement will be ensured through community participation in VDP preparation and identification of



beneficiaries. Communities will be engaged through community consultation/focus group discussions and content-specific leaflets and booklets. Consultations with different stakeholders will be maintained throughout the life of the project. These consultations will inform the implementation of key activities i.e., rural *haats* etc. and build stakeholder as needed, with a focus on women stakeholders.

91. **Grievance Redress Mechanism.** An integrated system will be established with a fully staffed Grievance Redressal Cell at the Department of Agriculture, when the sub-project planning process is initiated. Grievances, if any, may be submitted through various media, including in person, in writing to a noted address, e-mail, or through direct calls to a concerned official. The project, apart from a web-based mechanism, will have a three-tier grievance redress mechanism, at BPIU, DPMU and SPMU levels.

### GRIEVANCE REDRESS SERVICES

92. Communities and individuals who believe that they are adversely affected by a WBG-supported project may submit complaints to existing project-level grievance redress mechanisms or the WBG's Grievance Redress Service. The Grievance Redress Service ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WBG's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WBG non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the Bank's corporate Grievance Redress Service, please visit <http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service>. For information on how to submit complaints to the World Bank Inspection Panel, please visit [www.inspectionpanel.org](http://www.inspectionpanel.org).

## V. KEY RISKS

93. The overall project risk is assessed as **Substantial**.

94. **Macroeconomic risk is assessed as Moderate.** India's GDP growth has slowed in the past three years, and the COVID-19 outbreak is expected to have a significant impact. On the fiscal side, the deficit is expected to widen significantly in FY20/21, owing to weak activity and revenues, as well as higher spending needs. States also face significant fiscal stress owing to shortfalls in revenue and compensation associated with the Goods and Services Tax, as well as due to limits on borrowing. This being said, residual macroeconomic risks – and specifically risks of insufficient counterpart funding by the state of Chhattisgarh – are low and unlikely to compromise the achievement of the project's development outcomes. This is because: (a) the counterpart funding requirement (\$42.6 million) is modest as a share of state expenditures; and (b) the project directly supports growth and job generation in a critical sector.

95. **Sector strategy and policy-related risks are rated Moderate.** The main project risk from ongoing policy initiatives relates to potential changes to data privacy and protection. Activities directly or indirectly supported by this project collect personal data, i.e. name, age, ID number, gender, cell phone number, which could be used to identify an individual. Statistical data collection is governed by the *Data Collection*



*Act of 2008*, GoI which contains provisions to guarantee respondents confidentiality. A Personal Data Protection Bill is currently under preparation.<sup>44</sup> The implications of the Bill are not clear yet, and should it be approved, the Bank and DoAB will conduct a technical analysis of the potential impact of the effectiveness of the Bill on project design and discuss any modifications that may be needed.

**96. Technical design risks are rated Substantial.** The key risks are: (a) lack of experience in promoting nutrition-supportive agriculture, diversified and resilient farming and value chain development through decentralized mechanisms of bottom-up planning, working through community institutions, particularly in the remote, tribal-dominated areas in southern Chhattisgarh that include LWE-affected areas. Managing CHIRAAG efficiently and successfully will require strong institutional ownership and leadership from the state government, chiefly DoAB. Key technical design measures to mitigate institutional capacity risks are engagement of suitably experienced human resources from within and outside government, technical and operational capacity development for key line departments, TSA implementation support, and regular capacity building programs for state, district and block level teams. Improving service delivery of agriculture departments through the leveraging of ICT, results monitoring systems, online MIS with spatial/geographic information system mapping, beneficiary tracking portal, etc. will also be undertaken. Further, appointment of a senior bureaucrat as Project Director and an experienced Chief Operating Officer, will be key project success factors. For value chain development, as private sector engagement may be low and not immediate in remote areas, a technical support agency will be hired to support a state level value chain development cell.

**97. Institutional capacity for implementation and sustainability-related risks are rated Substantial.** GoCG's overall commitment to CHIRAAG continues to remain high as evidenced by state level Project Finance and Implementation Committee clearance. The renewed focus on agriculture through the recently launched *Nyay Yojana* and NGGB policy, is reflective of the overall priorities of the state government's agenda for inclusive rural growth, poverty reduction and rural and agricultural transformation. However, the risk to institutional capacity for implementation and sustainability is substantial, due to lack of DoAB prior experience in the implementation of a multilateral institution-funded project; and no proven institutional capacity to manage and coordinate multiple implementation agencies and project units. As indicated in the remedial measures for technical design, capacity will be built at state, district and block levels, and these teams will work with a range of experienced partners for delivery of timebound outputs; and manage delivery of project outputs.

**98. Fiduciary risks are assessed as Substantial.** The state's PFMS<sup>45</sup> will be used to the extent feasible. This being the state's first Bank-financed project in nearly a decade, many government departments and agencies are not familiar with Bank procurement norms and principles, framework and guidelines. The complexities of dispersed fund flows and implementation arrangements across multiple levels pose significant fiduciary risk of diluted accountability systems, which may result in less than reasonable assurance that Bank financing will be used for the intended purpose with economy and efficiency. Detailed

<sup>44</sup> <https://www.meity.gov.in/data-protection-framework>

<sup>45</sup> In 2004, GoCG launched the e-Kosh system to automate treasury activities, budget allocation, bill preparation, submission and centralized processing. Other modules including receipts, payroll, pension and e-payments have been added over time. A fully online e-Kosh "Cyber Treasury" was launched on April 1, 2017. The system facilitates e-budget allocation and distribution, e-bill preparation and submission by all 5,157 Drawing and Disbursing Officers across 28 treasuries and 40 sub-treasuries, and centralized bill processing and accounting.





financial and procurement assessments, design of sustainable fiduciary arrangements and training/handholding during the early stages of project implementation will mitigate the risk.

99. **Environment risk is assessed as Moderate.** Project activities are expected to have minimal and no adverse or irreversible environmental impacts and can be mitigated and managed through the measures outlined in the ESMF. The GoCG's ESMF and ESCP are in alignment with the Bank's Environment and Social Framework which outlines measures for mitigating minimal environmental risk and impact, institutional strengthening and capacity building, and monitoring and reporting mechanisms for the successful environmental management of project interventions.

100. **Socio-cultural risk is rated Moderate.** Project interventions are largely focused around tribal-dominated areas in southern Chhattisgarh that include LWE-affected areas. Planned project interventions are expected to benefit the local Indigenous population and not likely to have any negative impact. However, to prevent exclusion, an IPF has been prepared in line with the Bank ESS 7. Participatory tools will be used to implement various interventions, and consultations with different tribal groups and their leaders will seek inputs during the implementation process. The stakeholder engagement plan (ESS 10), details the consultation plan with different stakeholders throughout the life of the project.

101. **Stakeholder risk is rated Substantial.** Private sector engagement may be low and not immediate, given that the project will be implemented in remote areas, including LWE-affected areas. The project design incorporates several elements that respond to the socioeconomic and political economy context of tribal and LWE areas. Apart from these elements, it will leverage the longstanding presence, outreach and local credibility of NGOs and civil society organizations among communities, and other stakeholders as an important risk mitigation strategy. An LWE sensitization program will be delivered to all staff, partners and communities.



## VI. RESULTS FRAMEWORK AND MONITORING

### Results Framework

COUNTRY: India

### Chhattisgarh Inclusive Rural and Accelerated Agriculture Growth Project

#### Project Development Objectives(s)

The PDO of the proposed project is to improve income opportunities and the availability of nutritious foods in targeted households of Chhattisgarh's tribal-dominated areas.

#### Project Development Objective Indicators

Indicator Name	PBC	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
To intensify and diversify sources of income, and improve the availability of nutritious foods								
Beneficiary households with intensified and diversified sources of income (Number)		0.00	0.00	3,600.00	22,500.00	48,000.00	75,000.00	108,000.00
Of which, SCs and STs (Percentage)		0.00	40.00	50.00	60.00	60.00	60.00	60.00
Beneficiary households with increased number of food groups available (Number)		0.00	0.00	3,600.00	22,500.00	48,000.00	75,000.00	108,000.00
Of which, SCs and STs (Percentage)		0.00						60.00
Farmers reached with agricultural assets or		0.00	4,020.00	31,920.00	99,600.00	159,600.00	199,200.00	240,000.00





Indicator Name	PBC	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
services (CRI, Number)								
Farmers reached with agricultural assets or services - Female (CRI, Number)		0.00	201.00	4,788.00	34,860.00	63,840.00	99,600.00	120,000.00
Of which, SCs and STs (Number)		0.00	900.00	9,600.00	37,500.00	72,000.00	105,000.00	126,000.00

### Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
Community Empowerment and Institutional Strengthening								
Village development plans (Number)		0.00	150.00	500.00	1,000.00	1,000.00	1,000.00	1,000.00
Beneficiary LGs with at least 50% membership from SC/ST households (Number)		0.00	66.00	150.00	500.00	1,000.00	1,000.00	1,000.00
Beneficiary LGs with at least 25% women members (Number)		0.00	33.00	90.00	350.00	800.00	900.00	1,000.00
IFS operationalized and including nutrition-related SBCC sessions (Percentage)		0.00	0.00	20.00	30.00	50.00	75.00	85.00
Diversified, Resilient and Nutrition-Supportive Food and Agriculture Systems								
Beneficiary households supported with sustainable		0.00	300.00	10,275.00	21,375.00	22,050.00	22,050.00	22,050.00



Indicator Name	PBC	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
water management and soil improvement practices (Number)								
Increase in beneficiary household land area of more nutritious crops under production (Percentage)		0.00	10.00	10.00	20.00	20.00	30.00	30.00
Beneficiary individuals which have adopted resilient and improved technologies and practices (Number)		0.00	0.00	6,750.00	36,900.00	57,600.00	81,000.00	90,000.00
Of which, women beneficiaries (Number)		0.00	0.00	1,013.00	7,380.00	14,400.00	24,300.00	27,000.00
Beneficiary households adopting at least two IFS activities (Percentage)		0.00	0.00	10.00	15.00	20.00	25.00	30.00
Beneficiary individuals with improved baadis or backyard garden production (Number)		0.00	2,700.00	22,500.00	73,800.00	144,000.00	144,000.00	144,000.00
Of which, women beneficiaries (Number)		0.00	810.00	9,000.00	36,900.00	86,400.00	86,400.00	86,400.00
<b>Value Addition and Market Access</b>								
Common service centers supported with value addition and processing infrastructure (Number)		0.00	53.00	175.00	350.00	350.00	350.00	350.00
FPOs established under the project considered functional. (Number)		0.00	1.00	6.00	17.00	25.00	28.00	28.00



Indicator Name	PBC	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
FPOs engaged in aggregation, grading, and/or primary processing (Number)		0.00	0.00	0.00	6.00	11.00	14.00	14.00
Market linkage partnerships established (Number)		0.00	1.00	4.00	4.00	5.00	10.00	10.00
<b>Project Management, Monitoring and Knowledge</b>								
Partnerships with knowledge organizations (Number)		0.00	1.00	2.00	3.00	3.00	3.00	3.00
Project-related grievances registered and resolved (Percentage)		0.00	100.00	100.00	100.00	100.00	100.00	100.00
Decision Support System for Agriculture Department established (Yes/No)		No	No	Yes	Yes	Yes	Yes	Yes
Policy note developed on promoting and financing FPOs (Yes/No)		No	No	No	Yes	Yes	Yes	Yes

#### Monitoring & Evaluation Plan: PDO Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Beneficiary households with intensified and diversified sources of income	See PAD, Footnote 41.	Every six months	MIS, field visits, baseline,	Reports, field visits, desk reviews, meetings	SPMU



			end-line survey		
Of which, SCs and STs		every six months	MIS, field visits, baseline, end-line surveys	Reports, desk reviews, field visits, beneficiary meetings	SPMU
Beneficiary households with increased number of food groups available	Food items are categorized based on the 12 HDDS food groups. The number of food groups available (produced or purchased) has increased if the diversity of available foods has risen by at least one food group.	Every six months	MIS, field visits, baseline, end-line surveys	Reports, desk review, beneficiary meetings	SPMU
Of which, SCs and STs		Every six months	MIS, field visits, baseline, end-line surveys	Reports, desk reviews, beneficiary meetings	SPMU
Farmers reached with agricultural assets or services	This indicator measures the number of farmers who were provided with agricultural assets or services as a result of World Bank project support. "Agriculture" or "Agricultural" includes:	Every six months	MIS, field visits, baseline, end-line survey	Reports, field visits, desk reviews, meetings	SPMU



	<p>crops, livestock, capture fisheries, aquaculture, agroforestry, timber, and non-timber forest products. Assets include property, biological assets, and farm and processing equipment. Biological assets may include animal agriculture breeds (e.g., livestock, fisheries) and genetic material of livestock, crops, trees, and shrubs (including fiber and fuel crops). Services include research, extension, training, education, ICTs, inputs (e.g., fertilizers, pesticides, labor), production-related services (e.g., soil testing, animal health/veterinary services), phyto-sanitary and food safety services, agricultural marketing support services (e.g., price monitoring, export promotion), access to farm and post-harvest machinery and storage facilities, employment, irrigation and drainage, and finance. Farmers are people engaged in agricultural</p>				
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	activities or members of an agriculture-related business (disaggregated by men and women) targeted by the project.				
Farmers reached with agricultural assets or services - Female		Every six months	MIS, field visits, baseline, end-line survey	Reports, field visits, desk reviews, meetings	SPMU
Of which, SCs and STs					

#### Monitoring & Evaluation Plan: Intermediate Results Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Village development plans	Number of village development plans approved and financed.	Every six months	MIS, field visits, baseline, end-line surveys	Reports, desk reviews, beneficiary meetings	SPMU
Beneficiary LGs with at least 50% membership from SC/ST households	Project-supported LGs have at least 50% membership consisting of SC/ST.	Every six months	MIS, field visits, baseline, end-line surveys	Reports, desk review, beneficiary meetings	SPMU



Beneficiary LGs with at least 25% women members	Number of project-supported LGs with at least 25% women members.	Every six months	MIS, field visits, baseline, end-line survey	Reports, field visits, desk reviews, meetings	SPMU
IFS operationalized and including nutrition-related SBCC sessions	IFS' set up and operational, with nutrition-related SBCC sessions on diet diversity, maternal, infant and young child feeding, traditional recipes, maternal and child health and WASH. IFS use master trainers to conduct sessions for all households with farmers and vulnerable groups.	Every six months	MIS, field visits, baseline, end-line surveys	Reports, desk review, beneficiary meetings	SPMU
Beneficiary households supported with sustainable water management and soil improvement practices	Number of beneficiary households supported with sustainable water management and soil improvement practices.	Every six months	MIS, field visits, baseline, end-line surveys	Reports, desk reviews, beneficiary meetings	SPMU
Increase in beneficiary household land area of more nutritious crops under production	Average increase in land area under production of more nutritious non-paddy crops, with separate measure for increase in land area for millets, pulses, fruits, and vegetables (underground vegetables	Every six months	MIS, field visits, baseline, end-line surveys	Reports, desk reviews, beneficiary meetings	SPMU





	and trellis vegetables). This captures increases at extensive margin (households not devoting land to a certain crop) and intensive margin (households which increased land devoted to a certain crop). Average across seasons in a year will be measured for each household.				
Beneficiary individuals which have adopted resilient and improved technologies and practices	New technologies and practices derived from various project-provided training, e.g. INRM, IFS, climate smart agriculture, nutrition, integrated nutrient and pest management, crop specific package of practices, and other extension services.	Every six months	MIS, field visits, baseline, end-line surveys	Reports, desk reviews, beneficiary meetings	SPMU
Of which, women beneficiaries					
Beneficiary households adopting at least two IFS activities	IFS means at least two of: agriculture (field crop production in kharif and rabi season), horticulture (vegetable production in baadis for at least 7 months), livestock rearing (at least one type),	Every six months	MIS, field visits, baseline, end-line	Reports, desk review, beneficiary meetings	SPMU



	aquaculture (at least 6 months in ponds/hapas), or agroforestry (at least 2 types of trees planted).				
Beneficiary individuals with improved baadis or backyard garden production	Improved baadis means use of better quality inputs, adoption of improved package of practices and implementation of year-round production (at least 8 months/year).	Every six months	MIS, field visits, baseline, end-line surveys	Reports, desk review, beneficiary meetings	SPMU
Of which, women beneficiaries					
Common service centers supported with value addition and processing infrastructure	Common service centers receiving infrastructure investments for primary processing, postharvest handling and marketing.	Every six months	MIS, field visits, baseline, end-line surveys	Reports, desk reviews, beneficiary meetings	SPMU
FPOs established under the project considered functional.	FPOs established with business plans and financing.	Every six months	MIS, field visits, beneficiary meetings	MIS, reports, desk review	SPMU
FPOs engaged in aggregation, grading, and/or primary processing	Project-supported FPOs directly engaged in aggregation, grading, and/or primary processing activities.	Every six months	MIS, field visits, baseline, end-line surveys	Reports, desk review, beneficiary meetings	SPMU
Market linkage partnerships established	Partnerships, for inputs and outputs, between project-	Every six months	MIS, field visits,	Reports, desk review, beneficiary meetings	SPMU



	supported FPOs/LGs and value chain actors through MoUs, direct partnerships, or linkages formed.		baseline, end line surveys		
Partnerships with knowledge organizations	Through MoUs between SPMU and knowledge organizations.	Every six months	MIS, field visits, SPMU meetings	MIS, meetings with SPMU/knowledge organizations, reports	SPMU
Project-related grievances registered and resolved	Target beneficiaries have confidence in project transparency and accountability mechanisms that grievances will be addressed (complaints received vs. resolved).	Every six months	MIS, field visits, baseline, end-line surveys	Reports, meetings, SPMU/DPMU/BPIU beneficiary stakeholder consultations, MIS reports, inputs from web-based mechanism.	SPMU
Decision Support System for Agriculture Department established	Decision support system for Agriculture Department set up and rolled out to users.	Monthly for first 12 months	SPMU, missions	In-house meetings, missions	SPMU
Policy note developed on promoting and financing FPOs	Policy note developed on FPO promotion and financing.	Every six months	MIS, missions, working w/ ministries	SPMU updates	SPMU



## ANNEX 1: Detailed Project Description

### Component 1: Community Empowerment and Institutional Strengthening (\$14.9 million)

1. This component will build household and community capacity to: (a) plan, implement, and monitor development investments; (b) promote and strengthen community institutions for effective management of natural resources, productive infrastructure and private assets; and (c) undertake nutrition-sensitive agriculture, adopt dietary diversity and promote positive nutrition practices at household level.

2. **Subcomponent 1.1 Participatory Village Planning and Community Institution Building (\$12.3 million)** will support: (a) project awareness of targeted communities; (b) preparation of participatory, integrated VDPs including climate resilient activities; and (c) formation and/or capacity building of key community institutions to participate in project planning, implementation and monitoring of investment activities.

3. Participatory Village Planning. Project awareness will be created through social mobilization, information, education and communication (IEC) material development and village entry activities. The social mobilization and participatory planning process will be led by communities, supported by TSAs, Krishi Vigyan Kendra (KVK),<sup>46</sup> recruited community cadres and block level project teams. Household, village (community) and GP<sup>47</sup> (*gauthan*) level investments will be identified and prioritized through a village level planning process by a specialized TSA, using participatory rural appraisal exercises. Village level assessment will be undertaken to identify and prioritize nutrition interventions. The planning process will be informed by Indira Gandhi Krishi Vishwavidyalaya (IGKV's)<sup>48</sup> regional diagnostics, and landscape maps and satellite imagery accessed from the Department of Science and Technology. VDPs will include investments and activities at three levels, namely: (i) *gauthan*; (ii) village; and (iii) individual household. Plans will be consolidated at block and district levels, and then at SPMU level to inform physical and financial annual planning, and related Directorates to ensure timely mobilization of resources through convergence.

4. Community Institutional Strengthening. Formation and/or capacity building of key community institutions will be undertaken to: (a) enable participation in planning and implementation; and (b) prepare project investment plans for community and household benefits. At the village level, a multi-commodity LG will be formed as the key community institution to anchor project processes, interventions and investments. All interested households within a village may seek LG membership based on aspirations and motivation to strengthen their respective livelihood. Each LG will have an executive committee, with women adequately represented, that will be responsible for day to day coordination of activities. Considering the PESA Act,<sup>49</sup> the project will strengthen community institutions to not only comply with the Act's provisions, but also make them more participatory, inclusive, sensitive to local culture, practices and resources. Tribal women face intersectionality of barriers and have negligible individual or collective agency to participate effectively in decision-making processes. Through increased awareness and capacity building initiatives, the project will include more women in LGs and facilitate their active role, largely

<sup>46</sup> KVKs are local agriculture extension agencies functioning under agriculture universities or promoted by non-governmental organizations.

<sup>47</sup> A GP is the grassroots-level of governance system in India at the village-level or a group of small villages, and has a *Sarpanch* as its elected head. As part of NGGB policy under *Surajji Gaon Yojana*, the GoCG, together with the GP, establishes cattle daycare centers at GP level called *gauthans*.

<sup>48</sup> Indira Gandhi Krishi Vishwavidyalaya is the local agriculture university.

<sup>49</sup> The Act prescribes that the *Gram Sabha* or GPs at the appropriate level be consulted on project activities, particularly for planning and management of minor water bodies, minor forest produce and village markets. <https://tribal.nic.in/actRules/PESA.pdf>



tribal, in LG governance and management. Each LG will have smaller, informally organized, hamlet-level sub-groups for purposes of commodity-focused activities. Existing community institutions, such as village organizations, SHGs, producer groups, Joint Forest Management Committee, etc., based on their current performance and motivation may be included within LGs.

5. At the *GP* level, the project will work with *Gauthan* Committees to strengthen their operational viability and improve governance. Further, the project will form CRCs – informal bodies comprising 8-20 representatives drawn from community institutions of nearby villages in the catchment of existing *gauthans* – with the objective of supporting *Gauthan* Committees. CRCs will plan CHIRAAG investments at the *GP* level, in consultation with *Gauthan* Committees, and also ensure smooth convergence. In collaboration with KVKs, TSAs will build management capacity of CRC members. Training modules will be prepared to build the voice and agency of women CRC members, and capacity of female representatives will be built in resource management, actions for climate change adaptation, nutrition and other required technical skills such as planning, procurement, market access etc., so that they can perform at par with other members. The TSA will leverage ICT and conventional communication mechanisms for capacity development and institution building of *Gauthan* Committees and CRCs. Community resource persons will be hired and retained as a spearhead team.<sup>50</sup> The spearhead team's capacity will be built on the project's technical approaches through regular training and exposure visits.

6. The intersection between gender and ethnicity means that tribal women often face multiple disadvantages. The village planning exercise will engage with existing women's federations (village organizations/SHGs) and LGs to understand barriers faced by women producers and workers in tribal areas. The project will undertake a focused review in sample districts (with large tribal population) to understand barriers experienced by women, especially tribal. Based on the findings, the TSA hired for VDP preparation and facilitation will work with women to: (a) identify and address access gaps in agriculture assets and services; (b) integrate findings of the review in planning and delivery of services for improving outreach to tribal women; (c) strengthen the capacity of state offices to incorporate gender in the planning and delivery of services; and (d) positively target tribal women's participation in the decision-making processes of existing community-based institutions. The TSA will also provide handholding support to build tribal women representatives' decision-making and resource management capacities in community-based institutions. Key investments for all sub-component are detailed in Section II, Part B.

7. Key activities under sub-component 1.1 are: (a) generation of project awareness among targeted communities through village entry activities; (b) hiring of IGKV<sup>51</sup> to support regional diagnostics; (c) hiring of TSAs for VDP preparation and facilitation, planning and implementation support for INRM activities, nutrition intervention plans, institution strengthening, and capacity building support to *Gauthan* Committees,<sup>52</sup> LGs, CRCs and select existing community institutions;<sup>53</sup> (d) training and exposure visits of producers, community cadre for VDP; and (e) recruitment, training and operational costs of block level manager, community coordinator and marketing and value chain coordinator.

<sup>50</sup> There will be one Spearhead team for every 3 *GPs* (~8 villages), comprising 24 community resource persons (8 farm resource persons, 8 livestock resource persons and 8 nutrition resource persons) and 1 bookkeeper for every CRC.

<sup>51</sup> The local Agriculture University at Raipur, Chhattisgarh (<http://www.igau.edu.in/>)

<sup>52</sup> A 13-member Committee responsible for the *gauthan's* overall management, governance and administration in the *GP* comprised of a President chosen by the *Gram Sabha* (not necessarily Sarpanch), 5 village youth, a cowherd (*Charwaha*), representatives from *Panchayat* Wards, village SHGs, village Community Resource Persons, *Sarpanch*, Secretary and Rural Agriculture/Horticulture Extension officers. *Sarpanch* is the elected *GP* head.

<sup>53</sup> Village organizations, self-help groups, Joint Forest Management Committee, Producer Groups (PGs)



**8. Sub-component 1.2 Household Food Availability and Nutrition Practices (\$2.6 million).** Women's empowerment (including women's control of economic resources) is linked closely to household nutritional status and can result in decreased malnutrition.<sup>54</sup> Beneficiary communities and households, with a special focus on women as change agents, will be targeted to plan and consume diverse, locally available and nutritious foods in their households. Support will be provided to women and adolescent girls in the adoption of positive nutrition and related practices, including their engagement in improved and diversified *baadi*<sup>55</sup> supplying year-round nutritive food, thereby leading to improved nutrition outcomes of women and children.

**9. Social and Behavior Change Communication (SBCC).** A SBCC program will be designed and implemented to increase knowledge and influence the adoption of recommended maternal infant and young child feeding, and water, sanitation and hygiene (WASH) behaviors and practices. The SBCC strategy will focus on adolescent girls and young women to adopt sanitation practices and the benefits of improved nutrition through interactive messaging, kitchen garden demonstrations and regular meetings/ monitoring at the village level through *Gauthan* Committees. IFS Schools<sup>56</sup> and demonstrations will serve as platforms for information sharing and promotion of nutrition-related practices among women beneficiaries. IEC products, toolkits and campaigns on nutrition-supportive agriculture, nutrition diversity, critical nutrition practices and WASH behaviors will be designed to effectively reach tribal women. Leveraging good practice examples from other states,<sup>57</sup> the component will support deployment of a cadre of women nutrition facilitators (*Poshan Sakhi*)<sup>58</sup> to support social mobilization, household dietary diversity and adoption of positive nutrition practices.

10. Key activities under sub-component 1.2 include: (a) hiring of TSAs for nutrition SBCC; (b) technical assistance and implementation support for formative research, development of SBCC content and village-level material including SBCC toolkit for facilitation, training manuals and IEC material (flipbooks, posters, films and community-led videos); (c) nutrition training support for SBCC rollout; (d) recruitment and capacity building of *Poshan Sakhi*<sup>59</sup> including honorarium; and (e) material and equipment for need-based initiatives to empower communities to identify and manage their malnourished children, undertaken in coordination with Department of Women and Child Development frontline workers.

## **Component 2: Diversified, Resilient and Nutrition-Supportive Food and Agriculture Systems (\$48.5 million)**

11. Different from other population segments, tribal livelihoods, notably in remote, forest-fringe areas, continue to be subsistence-orientated with high dependence on natural resources. Key natural resources i.e., soil and water, will be assessed and sustainably developed to lay a solid foundation to develop more diversified food and agriculture systems, nutritive and productive, and more resilient to climate change.

<sup>54</sup> IFPRI Discussion Paper 01681, October 2017 'Nutrition-Sensitive Agriculture: What Have We Learned and Where Do We Go from Here?' by Marie T. Ruel Agnes et.al., Poverty, Health and Nutrition Division

<sup>55</sup> 'Baadi' as climate resilient 'gardens' adjacent to the house that follow reduced chemical input use and sustainable biodiverse farming practices promoted under component 2.

<sup>56</sup> IFS schools will include specially designed nutrition curriculum

<sup>57</sup> Several states in India have a functional *Poshan Sakhi/Poshan Mitra* cadre

<sup>58</sup> *Poshan Sakhi* are dedicated nutrition facilitators responsible for conducting sessions at NFSs. An essential element of good quality NFS programs is facilitator training to support the NFS process. NFS Master Trainers prepare facilitators in season long field-based programs, complementing practice with theory. Facilitators typically include non-governmental organizations, extension workers and self-help group women, with preference for training local women farmers as facilitators. This approach is being used in other states (e.g. Bihar), with demonstrated impacts.

<sup>59</sup> Women Nutrition Facilitators.



12. **Sub-component 2.1: Community-Based Natural Resource Management (\$19.6 million)** will support development and sustainable utilization and management of key natural resources (water and soil) using traditional local knowledge, community-based management systems and modern technologies.

13. Sustainable Soil and Water Management. The project will build on the state's policy on managing surface water (*Narua*),<sup>60</sup> by reviving, conserving and harvesting surface water through contextual technologies. Directorate of Agriculture's Soil and Water Conservation Unit, with TSA support, will adopt a community-based approach in planning/designing the soil and water conservation works and lead the implementation of these activities. To identify intervention sites, landscape maps at block level (~5,000 ha/33 km<sup>2</sup>) will be accessed from the Department of Science Technology, GoCG.

14. Water management for Crop Intensification and Integrated Farming. To increase access to water for supplemental irrigation, thereby intensifying and diversifying agriculture production systems, investments will be made in small water lifting devices, including those based on renewable energy (solar pumps, treadle pumps etc.) and water conveyance (i.e. lay flat pipes). Following agriculture conservation principles, energy efficient irrigation technologies i.e. gravity on-line drip irrigation, rain gun/sprinklers etc. will be promoted. Per the VDP, community-based energy efficient small irrigation systems<sup>61</sup> will be promoted for community orchards, agroforestry, small scale fishery and livestock-rearing activities.

15. Enhanced Soil Health. To improve soil health, the state policies of *Ghurwa*<sup>62</sup> and *GoDhan Nyay Yojana* will be supported and strengthened through scientific measures for soil health testing and soil nutrition measures that increase soil carbon, through increased availability and use of organic manure. The project will strengthen the Soil and Water Conservation Unit's institutional capacity for soil analysis and promote and/or strengthen distribution of soil health cards to beneficiary farmers. Accelerated adoption of locally appropriate integrated soil/crop nutrition management systems<sup>63</sup> will be done through demonstrations and training by KVKs. KVK capacity will be strengthened for increasing local availability of key bio-inoculants, bio-fertilizers etc. *Gauthan* capacity to increase the supply of improved compost<sup>64</sup> and organic manure to communities will be developed with infrastructure support under sub-component 2.2.

16. Key activities under sub-component 2.1 include: (a) investments in INRM, both land quality enhancement and rain-water harvesting activities; (b) investments in energy efficient water lifting and farm level irrigation; (c) investing in design and delivery of soil health cards and soil nutrition management technology demonstrations, mainly in the form of partial grants to develop NADEP<sup>65</sup> pits and vermi-compost units, and farmer training for increased soil-carbon sequestration and reduced on-farm GHG emissions.

17. **Subcomponent 2.2: Integrated Food and Nutrition-Supportive Agriculture (U\$28.9 million)**. Towards building a well-diversified, resilient and nutrition-supportive food and agriculture system, the project will finance interventions for developing Integrated Farming Systems (IFS), supporting

<sup>60</sup> *Narua*, as part of GoCG's NGGB policy aims to revive and conserve the surface water flowing through small rivulets, springs etc. by creating small structures and other measures to divert it for productive use.

<sup>61</sup> Such as community-managed farm ponds/irrigation, integrated orchard model etc. introduced in the Bank-assisted Accelerated Development of Minor Irrigation Project in West Bengal, India.

<sup>62</sup> *Ghurwa*, as part of the GoCG's NGGB policy, aims to suitably use 'cow dung' and manure for improving soil health.

<sup>63</sup> Farmyard Manure, improved NADEP compost, vermi-compost, vermi-wash, liquid manure, bio-inoculants, biofertilizers, green manure, crop rotation with legume etc.

<sup>64</sup> Vermi-compost, NADEP, vermi-wash, liquid manure, heap compost, farmyard manure etc.

<sup>65</sup> NADEP is a special bio-digester method of making improved compost.





infrastructure and district and state capacity to deliver essential inputs.. IFS will not only meet the input<sup>66</sup> requirements of various systems (crop/soil, animal, fish), but also de-risk climate shocks through broadened and interlinked local production systems across agriculture, horticulture, fishery and livestock.

18. Integrated Farming Systems (IFS). The primary objective of the IFS will be to address severe malnutrition challenges in project areas. Local production, availability and accessibility of nutritive foods will be augmented through IFS. The project will develop and scale up production systems, such as:

- (a) Food production in *baadi*; community orchards; cropping system focusing legumes, millets, root crops etc.; animal raising, especially small ruminants, backyard poultry, piggery dairy, fishery; and agroforestry. These bio-diverse farms, including introduction of biofortified varieties with higher levels of micronutrients, will supply year-round nutritive foods to households.<sup>67</sup> Based on prefixed criteria,<sup>68</sup> a basket of activity options, including climate resilient options, will be drawn from agriculture, horticulture, apiculture, livestock, fishery, agro-forestry, sericulture, etc. during the village planning process. Local KVKs will facilitate community pilots for the production of nutritive underutilized commodities. Households will be encouraged to choose at least two activities for scaling with CHIRAAG support. IFS will be implemented in *baadi*, open fields including Forest Rights Act lands and village common lands. Systematic scaling and deepening of multiple livelihoods will support year-round availability of community-preferred food baskets (millets, pulses, fruits, nuts, vegetables, edible roots/corms/rhizomes, honey, fish etc.) for households; and with potential for generating substantial surplus for local and distant markets.
- (b) Biodiversity and Agroforestry. Livelihoods of forest collectors are challenged by drudgery, low market return and climate change vulnerability.<sup>69</sup> Sustainable management and use of agro-ecological biodiversity will be a key approach for promoting household nutrition security and higher incomes. The project will promote sustainable conservation and utilization of local agro-forest biodiversity by investing in community awareness and capacity, documentation of indigenous knowledge, and developing locally aligned agro-forestry models,<sup>70</sup> climate smart technologies, varieties and practices. Local KVKs and IGKV, duly supported by other TSAs, will promote community action for agroforestry, biodiversity conservation and community infrastructure, such as village seed banks.
- (c) Technology Demonstrations and Technical Trainings. Following the Food and Agriculture Organization's farmer field school approach, IFS Schools will be designed and established to train producers on INRM, nutrition, horticulture, livestock, fisheries, integrated pest management, soil health, organic agriculture and CSA. The IFS schools will include support to lead farmers, on-farm technology demonstrations (all sectors), exposure visits and measures for farmer to farmer extension. Specialized agencies like IGKV<sup>71</sup> will: (a) coordinate the participation of local agriculture universities and associated KVKs in designing the activities; (b) prepare multimedia training tools,

<sup>66</sup> IFS use some outputs (e.g. by-products) and services of one production component as input to another within the farm unit. FAO.

<sup>67</sup> In partnership with the local agriculture university which has developed biofortified varieties for a few commodities e.g. sweet potato.

<sup>68</sup> Local agro-climatic suitability, potential year-round dietary diversity, community preference, existing production scale and market demand

<sup>69</sup> Chhattisgarh is the climate hot spot in India. Livelihoods of forest collection dependent households remain highly vulnerable. <https://openknowledge.worldbank.org/handle/10986/28723>

<sup>70</sup> *Successful Agroforestry Models for Different Agro-Ecological Regions in India*, Handa, A.K. et. al., 2019.

<sup>71</sup> IGKV is the single largest agriculture university with a robust technical resource base for agriculture extension, research and teaching in Chhattisgarh and therefore chosen as a strategic partner. IGKV has a vast network of KVKs working with communities on capacity building, local project management, monitoring and promoting new innovative agricultural and nutrition approaches. IGKV will play a central role in the project as 'a knowledge organization' for training, capacity building, technology demonstration and knowledge documentation.



guidelines, manuals, and ICT-based IEC material; and (c) coordinate training of trainers for community resource persons, agri-extension officers and piloting of IFS schools. Partnerships with national/global knowledge agencies, will support access to the latest approaches for technology adoption. Interventions under this component will improve women's access to technology through the development of small-scale, mobile, demonstration-sites specifically for women farmers and farm workers.

19. Support to LGs. LGs will be supported with grants to establish a revolving fund from which individual or group member producers, as determined by the LG, will obtain small loans to create productive assets at the household level in sync with the local IFS model. The loan and other seed capital grants, channeled through LGs will support lead producers/producer groups with higher level input production units i.e. nursery, composting, hatchery, fodder/feed production units etc. for onward supply of inputs to households at cost.

20. Community infrastructure: The *gauthans*<sup>72</sup> at the GP level, will play a central role to improve livestock management practices in line with one health aspects. To drive resource-efficient production activities and enhance cropping intensity,<sup>73</sup> the evolution of *gauthan* as a common service center for GP households will be piloted in project blocks. Investment through grants and technical support in building essential community infrastructure at *gauthans* will be in line with VDPs.<sup>74</sup> *Gauthan* Committee capacity, currently focused primarily on livestock-related activities, will be strengthened on the related technical assistance of their choice.

21. Strengthening State Capacity to Deliver Services in Tribal Areas. The project will support the upgrading of key infrastructure and capacity of agriculture, horticulture, livestock, fishery and sericulture departments, KVKs and other local agencies for continued supply of essential production inputs to project beneficiaries and others, especially seeds, saplings, planting material, soil health cards, improved breeds, artificial insemination kits, livestock management for reduced methane emission etc. The state's capacity to engage in diagnosis, surveillance and response mechanisms for emerging infectious zoonotic diseases related to livestock will be assessed and related 'one health' response measures will be supported through technical assistance. The project will invest in strengthening seed production capacity, with the objective of maintenance and multiplication of native seed varieties of rice, millets, leafy vegetables and biofortified material. This will boost the local production of nutrient rich millets and leafy vegetables. The project will work with: (a) IGKV for maintenance and production of early generation materials; and (b) the Directorates of Agriculture and Horticulture for multiplication and production of certified seeds. Select FPOs will be supported with common infrastructure for seed production, processing and marketing.

22. Key activities under sub-component 2.2 are: (a) **Household IFS production systems**: (i) grant support to LGs and other eligible community institutions through a 'revolving fund' to finance household level investments in productive assets and adoption of climate smart technologies and practices, as per VDPs; and (ii) support for gravity drip irrigation and fencing for *baadi* and orchards ; (b) **Community capacity and infrastructure**: (i) training of Community Resources Persons and honorarium; (ii) producer

<sup>72</sup> *Gauthans* are part of GoCG's NGGB policy and are meant to be cattle daycare centers. Under CHIRAAG, these *gauthans* will be developed into community service centers.

<sup>73</sup> Stray animals prevent cultivation of open field crops during winter (*rabi*) season. Management of cattle at *gauthans* will likely pave the way for improved crop intensity, particularly for pulses and millets.

<sup>74</sup> Activities such as largescale compost manufacturing, bio-fertilizer, agroforestry/horticulture nursery, community seed bank, mechanization center, storage, primary processing units etc.



training and capacity building; (iii) demonstrations of IFS and crop-specific models; (iv) inputs for individual and community *baadi*, backyard poultry, fishery and small ruminants; (v) support for village-level input production (goat, pig breeding units, community nurseries, poultry mother units, etc.) and animal trais/crates for artificial insemination; (vi) *gauthan*-level support for community infrastructure<sup>75</sup> to improve livestock feeding, manure management, storage, energy efficient tillage and farm operations through custom hiring, and energy efficient common service centers for processing; and (vii) support for fishery development; (c) **District/sub-district level capabilities:** (i) strengthening capacity of KVKs and government departments/agencies to establish horticulture nurseries, and upgrade department nurseries and brood hatcheries; and (ii) technical support for agro-forestry and biodiversity conservation, using local seeds and planting materials from village seed banks and drought-tolerant seeds to enable climate smart and energy efficient production systems; and (d) **State level capabilities:** (i) strengthening department capacity to scale up seed production of open pollinated varieties of pulses, millets, oilseeds and other underutilized tuber crops; and (ii) IGKV technical assistance for seed production through supply of breeder seeds and revival of locally adapted seeds, demonstration of climate smart technologies/inputs, and preparation of economic and management models for *gauthans*.

### **Component 3: Value Addition and Market Access (\$10.3 million)**

23. Toward improving household availability and consumption of nutritious food; reducing postharvest losses; and increasing access to profitable markets for surplus produce, the project will focus on: (a) promotion of safe food preservation and storage methods; (b) primary processing and value addition for local consumption; (c) building capacity and supporting FPOs for aggregation, primary processing, value chain development in select commodities through public and private partnerships; and (d) upgrading of local market infrastructure and strengthening community capacities.

24. **Subcomponent 3.1: Value Addition for Nutrition (\$1.0 million)** aims to increase the availability of nutritious foods among households and communities year-round by investing in better storage and reduced food wastage, value addition of surplus produce for local as well as external markets. Opportunities to supply local produce to large scale national programs (e.g. Integrated Child Development Services, [Mid Day Meal](#) and local schools) will be pursued.

25. Food Storage and Value Addition Facility. The common service centers at *gauthan* will be supported with common infrastructure for value addition and storage, and the capacity of select individuals/SHGs will be built, on improved technology and practices for dehydration, preservation and storage to retain nutritional value of commodities for longer periods. The project will provide grants to common service centers to access energy efficient small equipment and community warehouses for food storage. Training and capacity building support on technologies and operations and maintenance will be provided.

26. Strengthening and Leveraging Rural Markets. The project will invest in select rural *haats*, and with technical support, improve overall functioning and services. Rural markets will be supported and developed as socio-cultural and local trading spaces to spread awareness and nutrition information on foods, such as local leafy vegetables, wild fruits, etc., cooking and feeding practices and WASH.<sup>76</sup> The capacity of rural *haat* stakeholders with a key focus on women stakeholders, will be built for food safety

<sup>75</sup> Common infrastructure will comprise two types: (a) custom hiring center, where communities can access farm mechanization services at a nominal fee; and (b) common service center, where communities can access value addition, storage, and processing services at a nominal fee. The CRC or other nominated community institutions will manage and operate these common infrastructures.

<sup>76</sup> District Administration of Sukma is delivering healthcare services through *Haat Bazaar* Clinics.



and food handling systems.

27. Key activities to be financed under sub-component 3.1 include: (a) village-level energy efficient infrastructure support to LGs for postharvest, primary processing, packaging and storage; and (b) capacity building of nutri-entrepreneurs (LGs, SHGs and other community groups, individuals) in local value addition and energy efficient practices.

28. **Subcomponent 3.2: Value Addition and Market Access (\$9.3 million).** Local value addition and access to profitable markets should lead to higher returns for small producers and create local job opportunities. Small producers will be mobilized into FPOs (producer companies or cooperatives, per local context and producer preference) at the cluster (block/district) level for aggregation, value addition and access to profitable markets. Upon creation of a state specific FPO policy, a suitable approach will be adopted for FPO formation. FPOs should be socially inclusive, and as an economic, federated organization of interested and eligible<sup>77</sup> producers, their articles of association will be based on a set of performance criteria. Inclusion and active participation of women on FPO Boards of Directors will be pursued.

29. Support to FPOs. To leverage LGs' increased productive and commercial potential, at least two FPOs in each of the 14 project blocks will be formed and/or supported. Technical support will be provided to build the capacity of FPO board members, especially women, on governance, operations and business management, FM, marketing and managing market and production risks, including climate change. Small business planning grants will be provided to FPOs and aggregation, value addition<sup>78</sup> and marketing activities will be supported, once business plans are completed and approved. FPO capacity will be developed, through a TSA, to: (a) form FPOs and improve their governance and enterprise operation systems; (b) facilitate adoption of improved technology and practices<sup>79</sup> for value addition; (c) build linkages to profitable markets and buyers and develop related support mechanisms; (d) manage and mitigate production, market and climate risks (i.e. production planning, access/use of market information etc.). Investments will be made in handling, storage, value addition, traceability and certification, as informed by value chain analysis. Well-performing FPOs will be supported to take up nutri-enterprises and link them with Anganwadi Centers, schools and hostels, and market surplus produce at local *haat bazars*.

30. Value Chain Development. A TSA will set up a value chain development cell (VCDC) at the SPMU to: (a) undertake value chain studies and identify mass and niche market opportunities for surplus production of nutritive commodities, i.e. site specific and climate resilient; (b) develop private sector partnerships; (c) support FPO institutional capacity building, and management of market and climate-induced risks; and (d) provide technical, financial and market access support to FPOs. The VCDC will support strengthening state capacity on agribusiness, and though its objective will be to support value chain development in the project area, its broader scope will cover other state-determined priority areas. The VCDC will undertake value chain analysis of major commodities and prepare value chain development plans for select commodities of strategic relevance. Commodities with high uptake among women farmers and workers that better understand constraints faced in production, processing and accessing markets and transitioning to higher value products, will be prioritized. The VCDC, supported by a TSA, will assist in formation of FPOs and support them to meet statutory compliances, prepare business plans, raise

<sup>77</sup> Membership criteria will be established based on commodity, current surplus production, vicinity, interest and alignment of aspirations with producer collective objective.

<sup>78</sup> i.e., processing of cereals/millets/oilseeds; processing of fruits and vegetables and other horticulture produce i.e. dehydrated vegetables/ fruits, deseeding of tamarind, *chironji* decorticator, tikhur processing; cleaning and sorting of grains, seeds etc.

<sup>79</sup> Food safety guidelines and protocols under FSSAI, Good Manufacturing Practices etc.



finances, and build FPO Board capacity on production planning, business operation, finance and marketing.

31. The project will selectively invest in systems for differentiating products in more remunerative (domestic and export) markets through measures such as geographical indications, traceability, certification, etc. Following productive alliance approaches,<sup>80</sup> the VCDC will liaise with FPOs and lead private companies. The VCDC will facilitate the development of Public-Private-Community Partnerships with select national/international supply chain players, including International Finance Corporation investee clients. The VCDC will support the delivery of market advisory and decision support inputs to FPOs and other institutional stakeholders, through innovative ICT interventions, i.e. actual trade and market data, forecasts, advisories disseminated through mobile platforms and mobile apps etc.; and facilitate buyer-seller meets, industry summits, participation of key stakeholders in trade fairs.<sup>81</sup>

32. Key activities under sub-component 3.2 are: (a) hiring of a TSA to establish a state level value chain development cell (VCDC); (b) hiring of a TSA for FPO institution and capacity building including climate smart value chain development, climate-informed business plan development plus guidelines, manual development, etc.; (c) hiring of TSAs for development of specific commodity value chains (dairy/small ruminant/minor forest produce/horticulture etc.); (d) provision of business plan grants to FPOs (postharvest infrastructure using energy efficient systems and climate resilient technologies, working capital, technology, business operation setup, access to market) and capacity building; (e) support to select rural *haats*; (f) FPO linkages to profitable markets and provision of facilitation support including certification (organic, fair trade), traceability, packaging, branding; and (g) financing market promotion activities, IEC, and workshops/events, public-private-community partnerships, partnerships, market intelligence etc.

#### **Component 4: COVID-19 Economic Recovery Response (\$15.1 million)**

33. The COVID-19 Economic Recovery Response Component aims to mitigate food, health and income shocks and reduce vulnerability among communities, returnee workers and households in project areas, caused by the COVID-19 pandemic, and promote faster economic recovery. Local food supply and production will be stabilized and restored, and livelihoods and income opportunities will be stabilized and secured. Component activities will be fast-tracked and completed within the project's first 18 months.

34. *GPs* and villages, within the project area with a higher influx of returnee labor, will be prioritized for employment generating investments in land and water infrastructure. Activities will supplement the existing efforts of GoCG. *Gauthans* will be supported as centers for reskilling and entrepreneurship promotion among returnee labor, youth, and vulnerable households. To restore agricultural production activities and recapitalize households with their working capital requirements, farmers will be supported with basic agriculture input and production kits. Landless households will also be supported with livestock-based activities to augment their reduced income. Community and individuals will be supported to re-establish their vegetable plots and kitchen gardens and restore year-round supply of food and vegetables.

<sup>80</sup> <https://openknowledge.worldbank.org/handle/10986/25752>

<sup>81</sup> The project will drive the introduction of modern technology and innovation for postharvest management, processing, product development, by-product utilization, packaging, storage etc. through all components. Technologies related to solar drying, dehydration/preservation, food fortification, etc., as per market demand, will be introduced in partnership with local/national knowledge organizations, i.e. Central Food Technology Research Institute (CFTRI), National Institute of Food Technology and Entrepreneurship Management (NIFTEM) etc., which are described and financed under component 4.





In addition, efforts will be made to increase community awareness of COVID-19 and associated health risks. Precautionary and safety measures will be promoted.

35. This component will finance investments to: (a) restore livelihoods and support employment generation, e.g. *gauthans* as centers for reskilling, short-term work opportunities, and restoration of local livelihoods around livestock management and NRM through entrepreneurship; (b) support common service center/custom hiring centers for off-farm and non-farm entrepreneurial activities; (c) support goat breeding farms as part of entrepreneurship development; (d) agriculture and horticulture production mini-kits including climate smart technology inputs; (e) facilitate community-based natural resource management, wage generating land and water conservation-based activities; (f) enhance water availability for agriculture; (g) provide input and material support to communities and individual *baadis*; and (g) increase awareness of COVID-19 safety precautions and hygiene practices.

#### **Component 5: Project Management, Monitoring and Knowledge (\$11.2 million)**

36. **Sub-component 5.1: Project Monitoring and Management (\$10.7 million)** will support project coordination, implementation, FM, procurement, and environmental and social safeguards management at the state, district, cluster and community levels. A SPMU will be established drawing officers from the Directorates of Agriculture, Horticulture, Veterinary Services and Fisheries; hiring professionals from the market and engaging short-term consultants. The SPMU will be responsible for project implementation, in accordance with the agreed Project Implementation Plan, Community Operations Manual, COVID-19 Economic Recovery Response Manual, Project Agreement, Loan Agreement, the Environment and Social Management Framework and Commitment Plans, and Bank's fiduciary policies. The project will also establish DPMUs at district and BPIU at block levels to implement project activities. The BPIUs will report to respective DPMUs which will have a direct reporting line to the SPMU. Annex 2 provides detailed implementation arrangements.

37. The SPMU will hire TSAs to support project activities. Hiring of staff and consultants; training and capacity building, including exposure visits; procurement of resource/support agencies and service providers, office infrastructure, logistics support, MIS, geographic information system, ICT-mediated citizen engagement systems, and other operational expenses will be financed under this sub-component. Techno-managerial capacity building measures for state, district and block level teams will be undertaken at national/international institutes i.e. Indian Institute of Management, Raipur, Administrative Staff College of India, Centre of Good Governance etc. and through exposure visits.

38. Service delivery of DoAB will be improved through the set-up of a monitoring and evaluation learning cell with technical support for process monitoring, ICT and geographic information systems-based management information system, software applications, mobile applications etc. mainly for improving Soil Health Card development, delivery and traceability; and overall data management of project implementation. This will include an integrated dashboard at state level for planning and implementation monitoring at district, block and village levels. Results-based monitoring systems, online MIS with spatial/geographic information system mapping, beneficiary tracking portal, etc. will also be developed, as part of a decision support system. A bottom up overall data management system will be built by equipping the cluster coordinators with tablets and capacity building.

39. Key activities under sub-component 5.1 are: (a) Hiring of a recruitment agency; (b) salaries and overhead cost of state and district project management units; (c) setup of a monitoring, evaluation and



learning cell; (d) commissioned studies (baseline, mid-line, end-line) and process monitoring; (e) establishment of a MIS-based on ICT and geographic information system; and (f) study tours for officials.

**40. Sub-component 5.2: Knowledge Management and State Capacity (\$0.5 million)** aims to strengthen state capacity by infusing new information and knowledge, and improving systems and processes, based on similar development contexts from other states/countries. The project will support the creation of an ecosystem to capture, preserve and scale traditional knowledge and practices of tribal communities relevant to the project scope. Toward this end, knowledge exchange between stakeholders will be promoted. The knowledge exchange process within and between communities, states, south-south countries and between developing and industrial countries, will be actively pursued through virtual webinars, workshops etc. Systems for identification and validation of tribal traditional knowledge, integration or refinement with scientific knowledge, documentation and packaging of tacit and explicit knowledge, maintenance of repositories and dissemination of knowledge, will be set up. For wider community level adoption of new knowledge, information (relevant tribal traditional knowledge and those finetuned with modern scientific knowledge) and promotion of innovations, particularly to drive household nutrition and augment income of youth and women, the project will invest in awareness campaigns, conducting tribal traditional knowledge *melas*,<sup>82</sup> etc. Emphasis will be placed on tribal to tribal knowledge exchange by facilitating the flow of ideas and information across the region.

41. Partnerships will be sought with national and international organizations i.e. Central Food Technology and Research Institute, Mysore; Indian Institute of Forest Management, Bhopal; National Institute of Nutrition, Hyderabad; Bioversity International, etc. to access current knowledge on thematic focus areas, particularly climate change adaptation and mitigation technology. Stakeholder capacity will be built to facilitate accelerated adoption of such technologies/practices. For improved planning; inter-departmental convergence and functional integration; implementation and monitoring; and for promoting innovation, technical assistance support will be provided to project districts.

42. Key activities under sub-component 5.2 include: (a) partnerships with knowledge organizations; (b) hiring of a knowledge management and communication agency; and (c) support to district innovation through technical assistance for strengthening systems and processes, and commissioning studies, arranging events/meetings etc.

**Component 6: Contingent Emergency Response Component (\$0 million).**

43. This zero-budget project component will ensure implementation flexibility in the event of future emergencies and disasters, especially given Chhattisgarh's climate hotspot designation in South Asia, and its vulnerability to droughts, locusts and zoonotic outbreaks.

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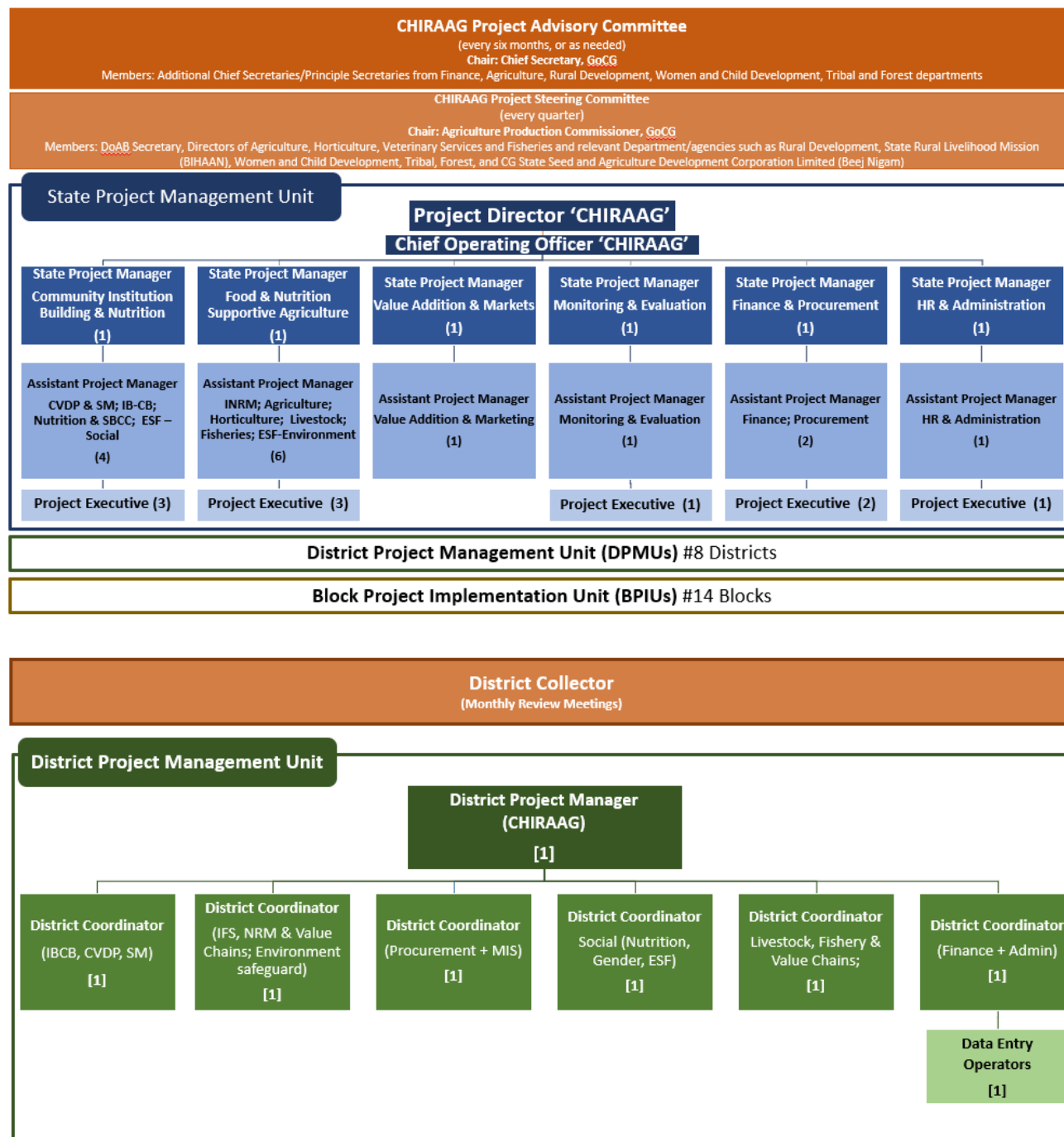
<sup>82</sup> Knowledge and technology fairs.

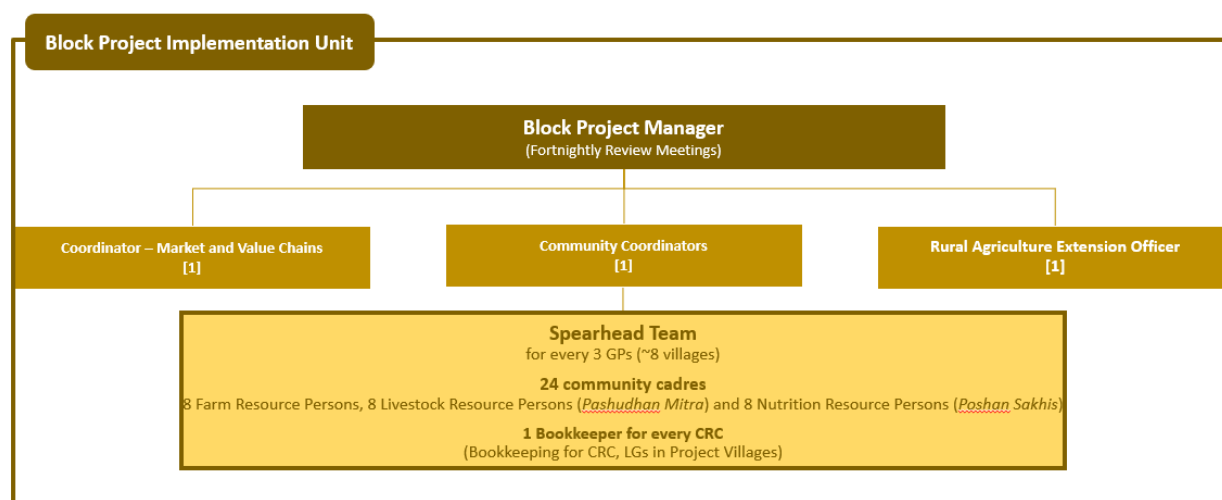




## ANNEX 2: Implementation Arrangements and Support Plan

Further to the details contained in the section on Implementation Arrangements, below are detailed organograms for each level of project management (also see Table 1, below).





**Community level:** At the community level, *Gauthan* Committees will be leveraged to gain village entry and convergence support (see Section II, Part C: Project Beneficiaries, Figure 4 for more detail). A CRC will be created to manage the larger CHIRAAG objectives under *Gauthan* Committees, other INRM activities and IFS management at village level. CRC representation will comprise LGs, FPOs, village organizations/ SHGs, Joint Forest Management Committees ensuring participation of women and tribal. At the village level, multi-commodity LGs will be constituted for mobilizing interested farmers and producers to improve their livelihood activities related to farming and allied sectors that would support planning, and implementation of activities related to productivity enhancement, aggregation, primary level value addition, and other collective actions. Community cadres, to be appointed per thematic requirement, will support groups to execute and improve management practices. LGs will be further consolidated into FPOs to aggregate them downstream especially in postharvest management, value addition and aggregation leading to successful market linkages. For every 3 *GPs* (~8 villages), there will be a spear head team comprised of 24 community resource persons (8 farm, 8 livestock and 8 nutrition resource persons). A BPIU Community Coordinator will manage the spearhead team. Additionally, a community resource person *cum* bookkeeper, based at each *gauthan's* CRC, will maintain registers, record transactional data, and minutes of CRC and LG meetings within the *gauthan* catchment area. The Community Operations Manual will include procurement arrangements applicable for community level activities.

**Table 1: CHIRAAG Project Organogram with Responsibilities**

Structures	Responsibility
Project Advisory Committee	Headed by the Chief Secretary, responsible for providing project oversight and policy guidance, overall monitoring and direction
Project Steering Committee	Headed by the Agriculture Production Commissioner/co-convened by the Project Director, CHIRAAG provides strategic advice and facilitation of convergence, approval of annual action plans & works, monitoring
SPMU	Headed by Project Director, CHIRAAG with dedicated thematic leads
DPMU	Under the direct supervision of the District Project Manager, a team of thematic professionals from the market will monitor and implement the project in the district and block.
BPIU	Day-to-day implementation and monitoring of the project in the selected CHIRAAG block.
<i>Gauthan</i> Committees/ CHIRAAG Resource Committee	Village entry, monitoring and oversight at village <i>panchayat</i> level and community interventions
Farmer Producer Organizations, Livelihood Groups	Implement activities, provide leadership, develop camaraderie, peer learning



### ANNEX 3: Financial Management and Disbursement

**Budgeting and Counterpart Funding:** The SPMU will prepare the Annual Action Plan for each Financial Year (FY) in the preceding FY, for which PSC approval will be sought by the SPMU Project Director. The project will be budgeted as a separate line item under DoAB. The Director, Department of Agriculture will be the authorized Drawing and Disbursing Officer drawing funds from the allocated project budget. For FY20-21, a budget provision of INR 50 crores has been made for CHIRAAG [Scheme Code 6353] under Demand No 13.

**Flow of Funds:** All project expenditures will be pre-financed from the state budget. The flow of funds from the budget will be based on disbursement advice raised by SPMU/DPMU/BPIU (and approved and forwarded by SPMU to the Directorate of Agriculture and processed centrally as direct payments or as fund allotments through e-Kosh. These will include: (a) payments to vendors, suppliers, consultants and service providers, including payments for project procurement undertaken by *Beej Nigam*; (b) releases to community institutions for approved sub-projects; (c) inter-unit transfers to [13] DPMUs to meet agreed district level work plans. At DPMU level, the Deputy Director Agriculture, as the designated Drawing and Disbursing Officer, may further sub-allot the project funds to Deputy/Assistant Director Horticulture (A/DDH), Deputy/Joint Director Veterinary Services, or the Deputy/Assistant Director Fisheries (A/DDF) through e-Kosh. As per requirements, the SPMU may also raise a disbursement advice, instructing the A/DDH or Joint Director Veterinary Services or A/DDF to allocate funds through e-Kosh to the Senior Agriculture Development Officer at sub-division level, as may be required.

**CHIRAAG Bank Accounts at SPMU/DPMU/BPIU and community level institutions:** At all levels, Drawing and Disbursing Officers will draw funds from e-Kosh and deposit to separate CHIRAAG bank accounts, opened upon approval of the State Finance Department. At community level, institutions (LGs, *Gauthan* Committees, FPOs) will open separate CHIRAAG bank accounts, for direct transfer of project funds.

**Set-up of CHIRAAG as State Scheme in PFMS:** The Project Director will be the State Scheme Manager for CHIRAAG and all bank accounts, including SPMU, DPMU, BPIU and community level institutions will be mapped and registered under the scheme in PFMS as implementing agencies. This will provide last mile visibility of bank account balances, fund transfers, and fund utilizations across the project. This will be a part of the Disbursement and Financial Information Letter and registration in PFMS will be a mandatory requirement for transfer of project funds into bank accounts at all levels. The mapping under PFMS will be under five separate levels: Level 1: State – SPMU and Beej Nigam; Level 2: District – DPMU, Deputy Director Agriculture, Deputy/Assistant Director Horticulture (A/DDH), Deputy/Joint Director Veterinary Services and Deputy/Assistant Director Fisheries (A/DDF); Level 3: Sub Division - Senior Agriculture Development Officer; Level 4: Community – recipient of large grants [> INR 5 lakhs] – Producer Collectives; and Level 5: Community – recipient of small grants [< INR 5 lakhs] - LGs and *Gauthan* Committees.

**Accounting and Maintenance of Accounting Records:** All expenditures processed at Directorate of Agriculture level will be accounted for in the state's e-Kosh system. E-Kosh will also record the funds drawn at DPMU and BPIU levels as expenditures. For all project funds drawn from e-Kosh [SPMU/DPMU/BPIU] and deposited in separate CHIRAAG bank accounts, manual accounting records [cash books, vouchers with supporting documents, reconciled bank statements] will be maintained by the respective GoCG officers. Quarterly Utilization Certificates will be prepared at all levels, compiled and consolidated for each district by Deputy Director Agriculture and submitted to SPMU within 30 days of close of each quarter. All



community level institutions receiving project funds will be required to maintain manual accounting books [cash books, vouchers with supporting documents, bank statements reconciled with cash books]. Project fund recipients must prepare Quarterly Utilization Certificates, compiled and consolidated for each district by Deputy Director Agriculture and submitted to SPMU within 30 days of the close of each quarter.

**Internal Controls, including internal audit:** Chhattisgarh General Financial Rules will provide the internal control framework, including internal audit processes for all project expenses using e-Kosh for accounting. For community level institutions, governance arrangements, the Community Operations Manual, financial and administrative procedures will guide FM processes, including the delegation of financial powers. Protocol for sharing of common costs between the Bank and other financing partners will be agreed and will guide the processes to be followed for attribution and accounting of the costs of shared resources.

**Financial Reporting:** The Project Director will be responsible for preparing quarterly financial reports using agreed project templates. The quarterly interim unaudited financial reports (IUFRs) will be submitted to the Bank within 45 days of the close of each quarter and will form the basis for disbursements from the IBRD Loan. The preparation of the quarterly IUFRs will be based on: (a) e-Kosh reports for all expenditures processed at Directorate of Agriculture and *Beej Nigam* levels, including funds drawn at DPMU and BPIU levels accounted for as expenditures in e-Kosh; and (b) consolidated statement of accounts of SPMU, DPMU plus BPIU and *Beej Nigam*. All sub-grants released to community institutions, following the standard operating protocols documented in the Community Operations Manual will be considered expenditures for disbursement purposes. The project will separately track and reconcile Utilization Certificates received from community institutions with the PFMS Dashboard report on unspent balances in bank accounts, which will be adjusted and refunded at project close at all levels.

**Staffing and capacity building:** GoCG finance staff at the Directorate of Agriculture and other district/sub-divisional levels will be responsible for managing project funds. To cope with the additional workload, additional accounting staff, on contract basis, will be engaged at the Directorate and SPMU level to support existing departmental staff to ensure adequate oversight of project FM performance.

**External audit:** Through the State Principal Accountant General, the Comptroller and Auditor General of India will conduct an external audit of departmental level project-related expenditures. Statements of expenditure at all project levels will be submitted to the Comptroller and Auditor General by June 30 each year to allow adequate time for the audit, to be conducted in accordance with terms of reference agreed by the Comptroller and Auditor General for audit of Bank-financed projects. Audit reports will be submitted within nine months of the end of each financial year. The SPMU will engage a firm of chartered accountants to conduct the annual statutory audit as per the agreed terms of reference.

**Disbursement arrangements:** The Bank will finance 67% of expenditures up to \$84.9 million, except for Component 4 which will be 100% financed. Disbursement will be based on quarterly IUFRs submitted to the office of Controller of Aid Accounts and Audit and the Bank. Disbursements will be as follows: (a) GoCG will pre-finance all project expenditures using the state budget; (b) on a quarterly basis, DoAB will prepare IUFRs [in INR] and electronically upload them to the Office of Controller General of Aid, Accounts and Audit portal; (c) Office of Controller General will process and electronically submit IUFRs to the Loan Office, World Bank, Chennai for disbursement in United States dollars; (d) World Bank Chennai will trigger the payment in United States dollar into the GoI Consolidated Fund maintained at the Reserve Bank of India New York; (e) on a back to back basis, GoI will transfer funds [in INR equivalent] to the Consolidated Fund of Chhattisgarh maintained in the Reserve Bank of India Nagpur.



## ANNEX 4: Procurement

Based on the Procurement Risk Assessment, associated mitigation measures are shown in Table 1.1.

**Table 1.1: Assessed Procurement Risks and Mitigation Measures**

Risk Factor	Mitigation Measure
Weak capacity due to non-familiarity with Bank projects and procurement procedures	<ul style="list-style-type: none"> <li>• Appropriate <i>procurement staffing</i> at SPMU, Division and DPMU level.</li> <li>• Assignment of an experienced team by <i>Beej Nigam</i>, suitably strengthened, if required, for project procurement</li> <li>• SPMU to be supported by a full-time <i>procurement consultant</i>.</li> <li>• Strengthening and capacity building of staff at state, division level through training at ASCI/NIFM. Other concerned DPMU staff to be trained by SPMU/division staff for support and monitoring of community-level activities.</li> </ul>
Highly decentralized project resulting in delays in procurement and contract management processes	<ul style="list-style-type: none"> <li>• <i>Community operational Manual to include procurement arrangements</i> for community drive development activities to ensure consistency across the board</li> <li>• The project implementation plan will specify the delegation and procurement implementation arrangements.</li> <li>• All procurement activities at SPMU, <i>Beej Nigam</i> and DPMU level to be included in <i>procurement plan in Systematic Tracking of Exchanges in Procurement (STEP)</i> and prior cleared by Bank. Procurement at community level to be collated and monitored by DPMU and shared with SPMU and Bank on biannual basis.</li> <li>• <i>Standard/ Model Bid documents and contract documents including e-Procurement documents</i> as agreed with Bank shall be used.</li> <li>• A <i>procurement management information system</i> for tracking and providing required information on all procurement activities and contracts at the decentralized level shall be developed.</li> <li>• <i>All records</i>, from procurement planning to contract completion, and procurement complaints shall be updated in STEP, retained in chronological order and made available as and when requested by the SPMU or Bank.</li> </ul>
Noncompliance with agreed procurement arrangements	<ul style="list-style-type: none"> <li>• The project shall ensure that the agreed processes and procedures are fully complied (including eligibility, debarment and Bank audit and review requirements).</li> <li>• A <i>robust complaint redressal mechanism</i> will be put in place. The complaint handling authority, the form of complaint register, response time, decision-making mechanism, and other features will be outlined in detail in the project implementation plan.</li> <li>• <i>Procurement prior and post review</i>: The Bank will conduct implementation support missions to review the procurement performance of the project. All contracts not covered under prior review by the Bank will be subject to post review during implementation support missions and/or special post-review missions, including missions by consultants hired by the Bank.</li> <li>• <i>For activities at community level, an annual post procurement review</i> for an agreed percentage of contracts shall be conducted by an SPMU- appointed independent consultant as per terms of reference and reporting requirements agreed with the Bank.</li> </ul>

**Staffing arrangements:** The SPMU procurement manager, supported by a procurement assistant manager and a procurement consultant, will carry out procurement. *Beej Nigam* will assign experienced and skilled procurement staff to handle assigned procurement activities. At the district level, the DPMU procurement officer will be responsible for procurement, as well as block level procurement, engaging in procurement capacity building of village communities and ensuring compliance as per the agreed community level



procurement arrangements. Procurement officials at all levels will undergo procurement trainings. The procurement point person will also facilitate maintenance of all procurement records and assist in any procurement review or information that may be requested from time to time. TSAs will also engage with community organizations to ensure appropriate implementation of project-financed activities.

**Procurement Planning, Methods and Threshold:** Based on agreed cost tables, the SPMU shall ensure appropriate procurement planning and uploading of the procurement plan for the first 18 months of project implementation (except community-level activities) in STEP for the Bank's prior clearance. Thereafter, the plan shall be regularly updated at least annually. The procurement plan (including contracts to be procured under advance contracting and retroactive financing) for the first 18 months of project implementation is uploaded in STEP for World Bank's prior approval. It sets out the selection methods, estimated costs, market approach, prior review requirements, and timeframes. The procurement plan shall be updated annually or as required. The below table details various procurement methods and market approaches to be used for Bank-financed activities. Unless otherwise agreed with the Bank, the Bank's standard procurement documents or model bid documents with national procurement procedure conditions as agreed with Gol, standard requests for proposal documents, and standard forms of consultant contracts will be used.

**Table 1.2: Procurement Methods and Thresholds**

Procurement approach and method	Thresholds (US\$ equivalent)
Open International (Goods, IT, and Non-consulting services) – Request for Bids (RFB)	>10 million
Open National (Goods, IT, and Non-consulting services) Request for Bids (RFB)	up to 10 million
National Request for Quotation (RFQ) – (Goods/Works)	Up to 100,000
Open International (Works) – Request for Bids (RFB)	>40 million
Open National (Works) - Request for Bids (RFB)	up to 40 million
Direct Selection	With prior agreement, based on justification For Goods/ Works/ non-consulting services: As per paragraph 6.8-6.10 of Procurement Regulations. For Consultants: As per paragraph 7.13-7.15 of Procurement Regulations
Framework Agreement	For Goods/Works/Non-consulting services: According to paragraphs 6.57-6.59 of Section VI of the Procurement Regulations For Consulting services: According to paragraph 7.33 of the Procurement Regulations
Force Account	In accordance with paragraphs 6.54 and 6.55 of Section VI of the Procurement Regulations, and with prior agreement in Procurement plan with the Bank
Consulting Services (Firms)	CQS: <0.3 million as per requirements of paragraphs 7.11 and 7.12 of Section VII of the Procurement Regulations. LCS, FBS: in justified cases QCBS, QBS: in all other packages
Shortlist of national consultants	Up to 800,000
Note: The applicable thresholds: unless prior agreed otherwise with World Bank are as under DPMU Procurement – up to \$100,000 equivalent; and Community Procurement – up to \$10,000 equivalent for activities below US\$10,000 through <i>Gauthans</i> and LGs and more than INR 5 lakhs through FPO.	

CQS = Selection Based on Consultant's Qualifications; FBS = Fixed Budget Based Selection; LCS = Least Cost Based Selection; QBS = Quality Based Selection; QCBS = Quality and Cost Based Selection; RFB = Request for Bids; RFQ = Request for Quotations.





**Table 1.3 Procurement prior-review thresholds**

- a) Works: All contracts more than \$10 million equivalent.
- b) Goods and IT: All contracts more than \$2 million equivalent.
- c) Non-consulting services: All contracts more than \$2 million equivalent.
- d) Consultants: All contracts more than \$1 million equivalent for firms and more than \$300,000 equivalent for individuals.
- e) Direct Selection: The justification of Direct Selection for all contracts.

**National procurement procedure conditions.** The Bank's Standard/Model Procurement Documents as agreed with Bank, will be used. National competition for the procurement of goods, works, and non-consulting services shall be in accordance with the established thresholds, and will be in compliance with Procurement Provisions under paragraphs 5.3–5.6 of Section V of the Procurement Regulations and the following National Procurement Procedures conditions agreed with Go I:

- a) Only the model bidding documents for National Competitive Procurement agreed with the GoI Task Force (and as amended for time to time), shall be used for bidding.
- b) Invitations to bid shall be advertised on a widely used website or electronic portal with free open access at least 30 days prior to the deadline for the submission of bids, unless otherwise agreed in the approved procurement plan.
- c) No special preference will be accorded to any bidder either for price or for other terms and conditions when competing with foreign bidders, state-owned enterprises, small-scale enterprises, or enterprises from any state.
- d) Except with the prior concurrence of the Bank, there shall be no negotiation of price with the bidders, even with the lowest evaluated bidder.
- e) Government e-Marketplace (GeM) set up by the Ministry of Commerce, GoI will be acceptable for procurement under the Request for Quotations (RFQ) method.
- f) At the Borrower's request, the Bank may agree to the Borrower's use, in whole or in part, of its electronic procurement system, provided that the Bank is satisfied with the adequacy of such system.
- g) Procurement will be open to eligible firms from any country. This eligibility shall be as defined under Section III of the Procurement Regulations. Accordingly, no bidder or potential bidder shall be declared ineligible for contracts financed by the World Bank for reasons other than those provided in Section III of the Procurement Regulations.
- h) The Request for Bids (RFB)/Request for Proposals (RFP) document shall require that Bidders/Proposers submitting Bids/Proposals include a signed acceptance in the bid, to be incorporated in any resulting contracts, confirming application of, and compliance with, the Bank's Anti-Corruption Guidelines, including without limitation the Bank's right to sanction and the Bank's inspection and audit rights.
- i) The Borrower shall use an effective complaints mechanism for handling procurement-related complaints in a timely manner.
- j) Procurement Documents will include provisions, as agreed with the Bank, intended to adequately mitigate against environmental, social (including sexual exploitation and abuse and gender-based violence), health and safety ("ESHS") risks and impacts.

**eProcurement:** Procurement under both international and national competitive procedures will be conducted through government e-tendering systems provided by e-ChIPS, which have been assessed and deemed acceptable by the Bank for national competitive bidding for goods and works. National Informatics Centre's system shall be used for consultancy services unless another system is accepted by the Bank. **Use of GeM:** Activities up to request for quotation threshold of \$100,000 equivalent may be procured using GeM details which shall be provided in the procurement plan and PPSPD.





**District level contractual activities.** DPMUs will be the focal point for procurement, reporting implementation progress to the SPMU, providing day to day guidance, training of trainers, handholding support to communities, overall coordination and oversight of procurement activities. DPMU-level contracts are not expected to exceed the request for quotations threshold of \$100,000 equivalent. Activity above \$100,000 shall be carried out with SPMU oversight. Upon VDP finalization, identified water conservation activities shall be implemented by the Directorate of Agriculture's Soil and Water Conservation Unit with coordination support from DPMUs and BPIUs. The Soil and Water Conservation Unit implementation team will include a procurement point person. All activities by the Soil and Water Conservation Unit will be prior reviewed and cleared in the Bank's STEP. Project activities are not envisaged to exceed the national competitive bidding threshold. A detailed list of key activities at SPMU, DPMU and Community levels shall be included as part of PPSD.

**Community level contractual activities.** A CRC will be created for managing activities related to INRM and IFS. VDPs will be based on micro plans, that will determine the activities to be carried out at community level, and a procurement plan based on each VDP shall be prepared. The concerned line departments and TSAs will engage with community organizations to ensure appropriate implementation of project-financed activities, per agreed procurement processes and procedures specified in the community manual. In accordance with VDPs, LGs and *Gauthan* Committees shall be eligible to carry out activities below \$10,000 equivalent, as per the agreed cost tables and based on SPMU prior approval under DPMU oversight, may carry out activities of more than INR 5 lakhs. For contracts not exceeding \$10,000 equivalent, information (similar to that required in STEP) shall be prepared in an Excel table on a biannual basis, collated and shared with the Bank. For activities exceeding \$10,000, the agreed process shall be followed. The SPMU and DPMU shall ensure that these activities fully comply with agreed procurement arrangements (including eligibility and debarment). The Community Operational Manual shall describe applicable procurement arrangements, processes and procedures for community procurement, and shall be made available by effectiveness.

**Internal controls: *Fraud and Corruption (F&C) and Audit Rights:*** The Bank's Anti-Corruption Guidelines, including the Bank's right to inspect and audit all accounts, records, and other documents relating to the project that are required to be maintained pursuant to the Financing Agreement shall apply.

**Contingent Emergency Response Component (CERC):** As and when triggered and agreed with the Bank, the SPMU shall follow the emergency procurement arrangements permitted to be used for such contingencies. Notwithstanding any provision to the contrary in this section of the document, emergency expenditures required under the CERC shall be procured in accordance with the procurement methods and procedures to be set forth in the CERC Operations Manual applicable to such CERC, as and when triggered and agreed with the World Bank. The arrangements applicable to the CERC shall not apply to other components that will follow the arrangements stated in the foregoing paragraphs.



## ANNEX 5: Economic and Financial Analysis

1. The economic and financial analysis assesses the project's economic soundness and its likely impact on target beneficiaries. Economic and financial impacts were estimated at two levels: (i) societal economic impacts of the project resulting from the overall project investment; and (ii) direct economic and financial impacts of the project's productivity and income enhancing interventions on primary beneficiaries.

2. The analysis considers project costs and project outreach assumptions at the time of appraisal (June 2020). The assumptions for the economic analysis are linked to the project's results framework and its PDO indicators, and it is informed by the results of the financial analysis, carried out for the project's main productive activities. A sensitivity analysis was conducted to assess the impact of changes in the main parameters affecting the project's economic outcome.

3. **Project Area and Beneficiaries.** Beneficiary households will be selected for project inclusion through a participatory, community-driven process. Due to the project's demand driven nature, targeted households will overlap across the sub-components, as most households will be mapped to at least two sub-sectoral interventions, to support the full cycle of nutrition-supportive, resilient production systems. The sub-sector-wise outreach will include about 180,000 households for nutrition sensitive and climate resilient agriculture, over 150,000 households for livestock, and 15,000 households for fisheries. Table 1 provides an overview of project costs, outreach and phasing assumptions, including estimated costs per main unit of output (e.g. farm household reached). This facilitates assessment of the project's efficiency at completion in terms of actual costs vis-à-vis planned costs per unit of output, and comparison with similar projects.

**Table 1: Outreach and Phasing of CHIRAAG**

Description	Unit	PY1	PY2	PY3	PY4	PY5	PY6	Total
		2021/22	2022/23	2023/24	2024/25	2025/26	2026/27	
Total project costs	INR M	1,330.2	2,477.7	3,011.1	2,130.2	882.2	575.2	10,406.5
	US\$ M	18.2	33.9	41.2	29.2	12.1	7.9	142.6
Number of project districts	District	8	-	-	-	-	-	8
Number of project blocks	Block	14	-	-	-	-	-	14
Number of project villages	village	50	250	400	300	-	-	1,000
<b>Comp 1.1 Participatory Village Planning and Community Institution Building</b>								
Total sub-component costs	INR M	200.9	219.2	249.4	243.1	236.9	231.5	1,381.1
	US\$ M	2.75	3.00	3.42	3.33	3.24	3.17	18.92
Number of LGs	LG	150	250	500	500	400	200	2,000
Number of CRCs	CRC	75	125	250	250	200	100	1,000
<b>Comp 1.2 Household Food Availability and Nutrition Practices</b>								
Total sub-component costs	INR M	30.3	50.1	66.0	56.0	49.3	24.0	275.7
	US\$ M	0.42	0.69	0.90	0.77	0.68	0.33	3.78
Nutrition training	HH	6,000	36,000	60,000	60,000	18,000	-	180,000
<b>Comp 2.1 Community-Based Natural Resource Management</b>								
Total sub-component costs	INR M	39.0	567.1	1,191.8	751.8	-	-	2,549.6
	US\$ M	0.53	7.77	16.33	10.30	-	-	34.93
Access to soil health cards	HH	10,000	50,000	70,000	50,000	-	-	180,000
Area under improved community-based	ha	-	3,750	8,750	5,000	-	-	17,500
Access to improved soil management	HH	4,000	7,000	7,000	2,000	-	-	20,000
<b>Comp 2.2 Integrated Food and Nutrition-Supportive Agriculture</b>								
Total sub-component costs	INR M	161.2	733.9	960.4	649.5	254.6	50.7	2,810.2
	US\$ M	2.21	10.05	13.16	8.90	3.49	0.69	38.50



Area under seed production	ha	10	30	85	75	-	-	200
Backyard poultry	HH	-	55,000	55,000	40,000	-	-	150,000
Artificial insemination promotion in dairy	village	-	200	280	240	-	-	720
Goat breeding farms	HH	100	1,000	500	200	-	-	1,800
Goat rearing farms	HH	5,000	20,000	20,000	10,000	5,000	-	60,000
Pig breeding farms	HH	-	30	30	40	-	-	100
Fishpond development	HH	-	2,250	5,250	5,000	2,500	-	15,000
Community pond renovation	pond	-	50	100	100	-	-	250
Custom Hiring Centers established	unit	5	60	100	30	5	-	200
Agriculture resource person supported	unit	50	300	500	150	-	-	1,000
Livestock resource person supported	unit	50	300	500	150	-	-	1,000
Artificial insemination paravets supported	unit	-	65	65	25	-	-	155
Support to gauthans for common	village	-	50	150	150	-	-	350
<b>Comp 3.1 Value Addition for Nutrition</b>								
Total sub-component costs	INR M	5.0	32.7	82.7	32.5	-	-	152.9
	US\$ M	0.07	0.45	1.13	0.45	-	-	2.09
Support to food processing for nutrition	village	50	250	600	100	-	-	1,000
<b>Comp 3.2 Value Addition and Accessing Profitable Markets</b>								
Total sub-component costs	INR M	51.8	195.1	251.7	212.2	173.3	85.0	969.1
	US\$ M	0.71	2.67	3.45	2.91	2.37	1.16	13.28
FPOs promoted	FPO	2	10	10	6	-	-	28
<b>Comp 4.1 COVID-19 Economic Recovery Response</b>								
Total component costs	INR M	630.1	467.4	-	-	-	-	1,097.4
	US\$ M	8.63	6.40	-	-	-	-	15.0
Villages covered	Villages	1,500	-	-	-	-	-	1,500
Farmers supported	HH	75,000	42,000	-	-	-	-	117,000
Gauthans supported	Gauthans	100	200	-	-	-	-	300
<b>Comp 5.1 Project Management, Monitoring, Evaluation and Learning</b>								
Total sub-component costs	INR M	210.0	195.1	202.1	167.8	161.4	177.3	1,113.5
	US\$ M	2.88	2.67	2.77	2.30	2.21	2.43	15.3
<b>Comp 5.2 Knowledge management and strengthening State capacity</b>								
Total sub-component costs	INR M	1.9	17.2	6.9	17.4	6.7	6.7	56.9
	US\$ M	0.03	0.23	0.09	0.24	0.09	0.09	0.78
Knowledge partnerships	unit	-	1	-	1	-	-	2
District convergence meetings	unit	-	1	1	2	2	2	8

**4. Economic Analysis.** The main project benefits that contribute to the project EIRR are increased/diversified targeted beneficiary incomes in the project area. Specifically, this will result from: (a) intensification and diversification of agriculture, livestock, and fisheries activities; (b) increase in area under irrigation resulting in increased cropping intensity and productivity; (c) improved marketing, postharvest management and processing; and (d) increased opportunities for farm and non-farm employment including self-employment.

5. In addition, there will be significant benefits from improved resilience to climate change and positive nutritional effects associated with diversification of production systems towards crops, livestock, and fisheries activities. It is expected that substantial employment will be generated due to the increased area under crop production – and the resulting opportunities for on-farm labor, particularly for the landless poor who are mainly employed in agriculture as wage workers – as well as handling, processing and marketing of incremental production.

**6. Assumptions.** The economic analysis assumes that PDO indicator 1 – 180,000 targeted households experience an increase in average real annual household income – will be achieved by project end. Based



on similar Bank projects in India, a base case assumes that beneficiaries will experience a 30% increase in real incomes. This assumption is considered realistic and supported by the financial analysis. Current estimates of average annual income of rural households in Chhattisgarh range from INR 71,064<sup>83</sup> to INR 87,264.<sup>84</sup> Assuming: (a) a present average annual household income of INR 75,000 (average of the two estimates, to be verified by the project's baseline study); (b) an average annual inflation of 5%; and (c) an average annual real household income increase of 3.3%<sup>85</sup> over the project period that would take place without the project; a 30% increase in average annual real household income of targeted households would result in an annual household income of INR 161,000 by project end (compared to ~INR 124,000 without the project). The economic analysis is based on constant prices for both benefits and costs. It was assumed that targeted households would achieve the 30% increase in income in year 4, after project support, with incremental increases in income from years 1 to 3.

7. The total financial project costs have been converted to economic costs (which exclude taxes and duties and price contingencies), using the Costab software. The analysis was carried out for a 20-year period, which is the estimated project life including the six-year project implementation period. It is based on 2020 constant prices, and a discount rate of 12% was assumed. The Indian Rupee (INR) was used as the unit of account and the official exchange rate of INR 73.0 to \$1 was applied when converting to US\$.

8. *Economic viability.* The project's EIRR over a 20-year period for the base case, excluding benefits from GHG emission reduction, is 23.5% with a net present value of \$72.8 million at a discount rate of 12%. Placing a monetary value on potential GHG mitigation benefits in terms of reduction in GHG emissions and increased carbon sequestration (estimated at 787,800 tons of CO<sub>2</sub> equivalent (tCO<sub>2</sub>e) over 20 years), the base case EIRR increases to 25.1% and 26.8% for low and high shadow price scenarios, respectively. This assumes that the low shadow price is \$40/ton at project start and reaches \$50 by project end (20 years) and a high shadow price of \$80 that reaches \$100 by project end. On this basis, at full development, annual GHG benefits are valued at \$10.7 million and \$21.4 million for the two scenarios, respectively.

9. *Sensitivity analysis.* A sensitivity analysis was conducted to assess the impact of changes in main parameters affecting the project's economic outcome as a result of changes in project costs and expected benefits from the production systems promoted by the project (crop, livestock, and fisheries); and delays in project execution due to risks identified in the project's risk analysis. Results show that the project remains economically viable even in the case of adverse changes in project costs and benefits. A reduction in project benefits by 20% results in an EIRR of 24.7%. A 20% increase in project costs combined with a 20% reduction in project benefits, coupled with a two-year delay of benefits, reduces the EIRR to 14.8%. Table 2 presents an overview of the sensitivity analysis including further scenarios.

**Table 2: Economic Rate of Return and Sensitivity Analysis**

Scenario			EIRR	ENPV (\$million)
Base Case (without GHG)			23.5%	72.8
Base Case (with GHG)			24.9%	82.1
Changes (without GHG)				
<b>Program Costs</b>	<b>Incremental Benefits</b>	<b>Benefits delayed by</b>		
+ 20%			19.1%	52.4
+ 40%			15.8%	32.0

<sup>83</sup> Estimates for Chhattisgarh, Doubling Farmers Income Committee's estimates for 2015-16.

<sup>84</sup> NABARD All India Rural Financial Inclusion Survey 2016-17.

<sup>85</sup> Budget speech.



	- 20%		18.2%	37.8
	- 40%		12.5%	2.9
+ 20%	- 20%		14.4%	17.4
+ 40%	- 40%		7.0%	-38.0
Base Case		1 year	19.1%	51.0
		2 years	16.0%	31.5
		3 years	13.7%	14.1
+ 20%	- 20%	1 year	12.0%	0.0
		2 years	10.1%	-15.6
		3 years	8.6%	-29.5
Switching Values <sup>a</sup>				
Costs		+	71.1%	
Benefits		-	41.7%	

EIRR = Economic Internal Rate of Return. ENPV = Economic Net Present Value.

<sup>a</sup> Percentage change in cost and/or benefit streams to obtain an EIRR of 12%, i.e., economic viability

10. The EIRR of the project is driven by two factors reflected in the PDO indicators: outreach and income increase of targeted households. The sensitivity analysis of the project EIRR on these factors reflect that the project design is moderately robust and even if the PDO indicators of income and outreach are at 80% of target values, the project's EIRR is 14.2%, slightly above the social discount rate of 12.0%. Table 3 presents the EIRR against achievement of PDO indicators.

**Table 3: Economic Rate of Return vs. Achievement of PDO Indicators**

		% Outreach Target			
		120%	100%	80%	60%
% Achievement of PDO Target on Incomes	120%	33.6%			
	100%		23.5%		
	80%			14.2%	
	60%				5.2%

11. *Impact on production and nutrition.* As shown in Table 4, the project will result in increased production of vegetables, fruits, livestock produce, and fish. The expected increase for fruits is 3.5% of present annual state production. The expected production increase for vegetables and fish are at around 1.1% and 4.5% of the present annual state production, respectively, and this increase is considerably higher at 19.0% for eggs. A specific market analysis for the different produce is yet to be carried out under the project. Given increasing demand, particularly in urban areas as a result of population increase and increases in income, it is safe to assume that incremental production resulting from the project will not depress producer prices. The expected increase in annual fish production of around 16.3 tonnes resulting from the project would substitute imported fish (with better quality local fish) and also contribute to GoCG's attainment of the projected annual demand. The project is expected to not only contribute to overall improved incomes and food security in the state, but also to improved nutrition mainly through increased production and availability of nutrient-rich products, especially vegetables, meat, fish and eggs.

**Table 4: Estimated project impact on production**

Activity	Unit	Total Annual Production		Incremental Annual Production (%)	Total Annual State Production	'With Project' - Share of State Production
		Without Project	With Project			
Vegetable production	'000 tons	32.2	54.8	70.4%	6,890.5	0.8%
Fruit production	'000 tons	44.40	57.564	29.6%	2,542.2	2.3%



Egg production	million unit	156.0	360.0	130.8%	1,892.8	19.0%
Fish production	'000 tons	4.64	20.9	351.1%	469.0	4.5%

12. **Fiscal impact.** GoCG's contribution to the project amounts to INR 3093.7 million (\$42.6 million) or 30% of total project costs (including beneficiary contribution and convergence). This corresponds to an average annual GoCG contribution over the project life of INR 515.6 million, representing around 0.32% of the average annual GoCG budget for agriculture and allied departments involved in the project (Agriculture, Horticulture, Animal Husbandry, Fisheries, Soil and Water Conservation etc.) over the period 2017/18–2020/21 (average budget of INR 161.028 million or \$2,268 million). In the medium- to long-term, a substantial positive fiscal impact of the project is expected, mainly due to: increased output, income and employment, also resulting in increased tax revenues; and multiplier effects due to increased disposable income of project beneficiaries, resulting in increased demand for goods and services.

13. **Financial Analysis.** The financial analysis has been carried out for the main productive activities supported by the project. Detailed crop budgets were prepared for major agriculture and horticulture crops for typical smallholder plot sizes, providing an overview of the production system including the key production parameters, farmer organizations, investments and marketing channels. Similar analyses were prepared for livestock production models (for goats, pigs and poultry) and fish production systems (small and large ponds). The main financial performance measures, including gross margin, net profit, return to family and total labor, and the return on investment are calculated for the Present, Future without Project (FWOP) and Future with Project (FWP) scenarios. If applicable, the Investment Costs including required Working Capital and Annual Depreciation were calculated.

14. The results show considerable increase in gross margin, net profit, and return to family and total labor for all production systems. The financial analysis suggests that the PDO indicator of a 30% increase in average real annual household income of the targeted households is achievable due to diversified or intensified economic activities promoted by the project. Table 5 shows the estimated incremental annual net income per household as well as the initial investment costs and the incremental annual costs of intermediate inputs (working capital requirements) for the main productive activities supported by the project. It is expected that the financial analysis will be periodically updated as an integral part of the project's monitoring and evaluation system and as an input into the project evaluation at mid-term and completion stages.

**Table 5: Overview of Financial Analysis of Productive Activities Supported by the Project**

Activity	HHs supported	Annual Net Income			Incremental intermediate inputs	Investments per household
		WoP	WP	Increase		
Private Orchard	2,050	121,134	179,254	58,120	16,086	100,000
Backyard poultry	150,000	11,483	35,190	23,708	25,938	7,000
Goat breeding	1,800	5,194	21,904	16,710	4,723	20,000
Goat rearing	60,000	12,164	18,778	6,614	2,460	30,000
Pig breeding	100	12,466	71,653	59,187	21,306	35,000
Fishponds – private	15,000	11,400	58,491	47,091	36,965	4,000
Fishponds – community	250	5,238	54,101	48,863	49,896	104,000
Agriculture – Kharif	180,000	7,869	14,964	7,095	931.6	\a
Agriculture - Kharif + Rabi	57,150	34,143	56,494	22,351	1,476.9	
\a Investments are not built into the farm models but are covered under other project interventions such as NRM, improved soil health etc.						





## ANNEX 6: Green House Gas Estimation and Climate Co-Benefits

### Part A: Climate Co-Benefits

1. The project presents several opportunities to generate climate co-benefits, both for adaptation and mitigation, and has a strategy for reducing GHGs. The project entails generation of co-benefits at multiple stages under various components: (a) Community Empowerment and Institutional Strengthening; (b) Diversified, Resilient and Nutrition-Supportive Food and Agriculture Systems; (c) Value Addition and Market Access; (d) COVID-19 Economic Recovery Response; (e) Project Management, Monitoring and Knowledge.
2. The Table 1 below sets out the climate vulnerability context; lists the project's intent and statement of purpose for addressing climate vulnerability; and outlines an explicit link with the project activities. Table 2 provides component/sub-component-wise key activities that will have direct and/or indirect climate co-benefits. In addition, Part B offers a detailed analysis of the GHG impact, based on project interventions.

**Table 1: Climate Vulnerability Context, Project's Intent and Link to Project Activities**

<b>Climate vulnerability context</b>	<p>Chhattisgarh, a poverty hotspot and home to large tribal populations, is one of the top two climate hotspot states in India and is predicted to experience a decline in living standards of more than 9%. The two districts of Durg and Raj Nandagaon are also in the top 10 climate hotspot districts in the country.<sup>86</sup> Within the state, the pattern of vulnerability of Chhattisgarh districts to climate change has shown that generally the South Western and North Eastern districts are the most vulnerable to climate change. Notably high poverty (55-80%) and malnourishment (34-45% among children) in the targeted southern districts (refer Figure 3), suggest that targeted areas are highly vulnerable to climate shocks. Further, the Chhattisgarh State Action Plan for Climate Change, has noted that agriculture and allied sectors, forests and biodiversity, and water resources are sectors facing immediate and direct impact of climate change.</p> <p>Targeted districts are also highly water-stressed (&lt;6% irrigation, see Figure 2). High dependence of large populations on rainfed subsistence agriculture and livestock renders the local community highly vulnerable to climate shocks, especially under changing patterns of erratic rainfall in the state. FCDO's Action on Climate Change (ACT) study reveals that state incidences of drought, hailstorms, cyclones and flash floods have risen, impacting crop productivity in different agro-climatic zones. The study notes that a shift in the sowing season of <i>kharif</i> crops in the last three to four years due to delay in onset of the south-west monsoon and has impacted paddy production negatively and increased distress migration.</p> <p>The Bank's South Asia's Hotspots analysis warns that risks associated with changes in average weather are expected to increase over time when combined with poverty, lack of education, and poorly maintained infrastructure – all Chhattisgarh characteristics. Given uncertain shifts in weather and climatic events, small and marginal farmers, and project beneficiaries, will be unduly exposed to risk and farm distress. Adaptation and mitigation approaches have been mainstreamed into the project design to increase resilience against such risks. Project design was informed by a social analysis of the state which analyzed climate data, including changing rainfall pattern.</p>
<b>Statement of purpose</b>	<p>The project aims to improve income opportunities and the availability of nutritious foods in targeted households of Chhattisgarh's most vulnerable tribal dominated areas in southern districts, through adoption of a developmental approach centered on diversified livelihoods and foods, resource efficient-growth and IFS. The approach in itself is a step toward shifting the state's attention to a climate-resilient future, especially for its vulnerable tribal population. The approach is also expected to reduce, limit, or sequester GHG emissions to reduce the risk of climate change.</p>

<sup>86</sup> Mani, Muthukumara, Sushenjit Bandyopadhyay, Shun Chonabayashi, Anil Markandya, and Thomas Mosier. 2018. *South Asia's Hotspots: The Impact of Temperature and Precipitation Changes on Living Standards*, South Asia Development Matters, Washington, DC, World Bank.





<b>Link to project activities</b>	The project aims to:
	a) build community institutions to plan, develop and monitor VDPs including adaptation to changing climate risks;
	b) empower local communities to adopt improved practices for food and nutrition security especially for vulnerable sections i.e., women and children under climate shocks;
	c) promote climate-resilient agricultural technologies and CSA practices, following a strategic resource efficient agriculture production system approach that includes INRM mainly soil and water, nutrition-supportive IFS focusing on agroforestry, livestock, aquaculture; and value addition to reduce food wastage;
	d) invest in mitigation measures to reduce the impact of GHG emissions in agriculture production systems particularly through energy efficient tillage, improved livestock feed management and manure management in <i>gauthans</i> , and accelerated use of renewable energy-based systems in water lifting, processing, storage, rural markets;
	e) promote agro-biodiversity through investments in conservation of local seeds and planting materials through village seed banks and use of drought-tolerant seeds; and strengthen institutional capacities for increased and timely availability of quality climate smart inputs;
	f) build capacities, especially of vulnerable tribal population including women, towards adoption of climate-resilient practices, to enhance household nutrition security and resilience against climate shocks;
	g) strengthen capacity of participating Directorates to identify and proactively ensure that preparation, selection and approval of VDPs and annual implementation plans are climate-informed and screened; and
	h) Sensitize value chain players to invest in climate-resilient technologies and state services.

**Table 2: Component-wise Adaptation and Mitigation Climate Co-Benefits**

Activities	Adaptation Actions	Mitigation Actions
<b>Component 1: Community Empowerment and Institutional Strengthening (\$14.9m)</b>		
<b>Sub-component 1.1: Participatory Village Planning and Community Institution Building (\$12.3m)</b>		
<ul style="list-style-type: none"> <li>Project awareness among targeted communities through village entry activities that foster social capital development and rapport building.</li> <li>Preparation of integrated VDPs through participatory planning process to include climate resilient activities.</li> <li>Formation and/or capacity building of key community institutions to participate in project planning, implementation and leveraging of project investments for community and household benefits in adapting and adopting climate smart activities.</li> </ul>	<ul style="list-style-type: none"> <li>Increased community awareness and information about local climate change impacts and associated livelihood risks.</li> <li>VDPs will be climate-informed and ensure that community resources allocated further climate-resilient investments, mainly among poor and vulnerable tribal households.</li> <li>Community institutions formed and strengthened for planning, community actions and quicker adoption of resilient technologies and practices, building community resilience to climate shocks.</li> </ul>	
<b>Sub-component 1.2: Household Food Availability and Nutrition Practices (\$2.6m)</b>		
<ul style="list-style-type: none"> <li>Village level assessment for design of context-specific nutrition interventions.</li> <li>Technical assistance for nutrition SBCC</li> <li>Community resource persons (<i>Poshan sakhis</i>).</li> <li>Formative research, development of SBCC content and village level material, including SBCC tool kit for facilitation, training manuals and IEC material.</li> <li>Need-based initiatives to empower communities to identify and manage severely malnourished children.</li> </ul>	<ul style="list-style-type: none"> <li>Household nutrition security plans informed by local knowledge on household level nutrition risks and vulnerabilities compounded under climate shocks.</li> <li>Improved behavior and actions of vulnerable households to adopt scientifically informed adaptation practices and activities for food and nutrition security.</li> <li>Door to door campaign, with IEC material on local nutrition security, mainly for vulnerable individuals, to increase community resilience against food and nutrition security risks.</li> <li>Communities adopting new practices to identify and manage local malnourishment challenges arising due to climate variabilities.</li> </ul>	



Activities	Adaptation Actions	Mitigation Actions
<b>Component 2: Diversified, Resilient and Nutrition-Supportive Food and Agriculture Systems (\$48.5m)</b>		
<b>Sub-Component 2.1 Community-Based Natural Resource Management (\$19.6m)</b>		
<ul style="list-style-type: none"> <li>Investments in INRM, include both land quality enhancement and rainwater harvesting activities.</li> <li>Energy efficient water harvesting, water lifting and farm level irrigation infrastructure.</li> <li>Soil health cards (180,000 farmers) and demonstration of soil nutrition management technology.</li> </ul>	<ul style="list-style-type: none"> <li>Land leveling, energy efficient tillage, improved soil management, rainwater harvesting (small ponds) will reduce surface run off, reduce soil erosion, increase soil water retention capacity, improve ground water recharge and increase improved production, reducing climate vulnerability.</li> <li>Accelerated adoption of integrated soil nutrition management technologies and practices, such as legume-based crop rotation, green manuring, mulching, crop-biomass incorporation in soil, bio-inoculants etc. will improve soil productivity, thereby improving crop/tree productivity.</li> </ul>	<ul style="list-style-type: none"> <li>Increased usage of energy efficient water lifting devices (solar/treadle pumps) will replace diesel pumps, reduce energy use in irrigation and lead to substantial GHG emission reductions.</li> <li>Judicious fertilizer application based on soil health card prescription has multifold benefits – reduced fertilizer use and increased use of organic manure will also improve soil-moisture holding capacity, reducing irrigation requirements, and protecting water bodies from run-off pollution. The existing carbon pool will improve through increased soil-carbon sequestration.</li> <li>Large scale demonstration of improved composting techniques (NADEP, vermi-composting, bio-digester) with reduced GHG emission</li> </ul>
<b>Sub-Component 2.2 Integrated Food and Nutrition-Supportive Agriculture (\$28.9m)</b>		
<ul style="list-style-type: none"> <li>Grants to community institutions as revolving funds to finance household level investments in productive assets and adoption of climate smart technologies and practices as per VDPs.</li> <li>Demonstrations of IFS and crop-specific models.</li> <li>Training and capacity building of producers including in CSA.</li> <li>Inputs for food production in <i>baadi</i> and open fields.</li> <li>Set up of village level input production units including climate smart inputs.</li> <li>Fodder development initiative.</li> <li>Community infrastructure at <i>gauthan</i> level for improved livestock feeding, manure management, climate smart storage, energy efficient tillage and farm operations</li> <li>Strengthening capacity of KVKs and government departments/agencies</li> </ul>	<ul style="list-style-type: none"> <li>Access to finance will help accelerate adoption of climate smart technologies and practices at household level (by at least 240,000 farmers)</li> <li>At least 144,000 households will plant horticulture trees/crops in <i>baadi</i> enhancing adaptation to climate shocks and increasing local food supply.</li> <li>IFS will meet the critical input requirements of crop/soil, animal, fish systems, de-risking climate shocks through broadened and interlinked local production systems across agriculture, horticulture, fishery and livestock.</li> <li>Conserving biodiversity (local germplasm/variety crops) and introducing new cultivars (stress tolerant, biofortified etc.) will increase resilient crop production systems under climate shocks and contribute to local food and nutrition security.</li> <li>Empowering communities to conserve local biodiversity and storage of seeds in village seed banks will improve communities' ability to adapt to climate change shocks.</li> <li>Strengthening local institutions for increased availability of climate smart technologies/inputs (seeds of local crop types, drought tolerant varieties, seed banks, integrated pest management</li> </ul>	<ul style="list-style-type: none"> <li>Afforestation (plantations) and agroforestry on non-forested land that increase carbon stocks will further contribute to productive use of land by reducing topsoil loss.</li> <li>Resource efficient production systems through reduction in use of nitrogenous fertilizers and pesticides leading to improved soil health outcomes with lowered GHG emissions and improved soil carbon sequestration.</li> <li>Improved livestock management at 500 <i>gauthans</i> catering to at least 100,000 cattle with improved feeding practices and manure management, including bio-digestors; and</li> </ul>



Activities	Adaptation Actions	Mitigation Actions
<p>with finance support to establish mother nurseries, brood hatcheries, units for bio-inoculants/ integrated pest management inputs; <i>baadi</i> model units; training and exposure visits of producers/collectors/ community cadres/project staff;</p> <ul style="list-style-type: none"> <li>• Agro-biodiversity investments, mainly conservation of local seeds and planting materials through village seed banks and use of drought-tolerant seeds which will enable climate smart and energy efficient production systems.</li> <li>• Strengthening capacity of directorates of agriculture and horticulture and budget for scaling up seed production of pulses, millets, oilseeds and other underutilized crops; nurseries for horticulture and agroforestry saplings.</li> <li>• Supply of breeder seeds and revival of locally adapted seeds, demonstration of climate smart technologies/inputs, and preparation of economic and management models for <i>gauthans</i> through strengthened participation of local agriculture universities.</li> </ul>	<p>kits, horticulture and agroforestry saplings) will improve access to inputs and accelerate climate smart technology adoption among local communities at scale.</p> <ul style="list-style-type: none"> <li>• Provision of more effective knowledge and advisory support for adoption of CSA will improve climate resilience of farmers.</li> </ul>	<p>improved goat/piggery/poultry rearing undertaken by approx. 62,000 households will reduce methane or other GHG emissions significantly.</p> <ul style="list-style-type: none"> <li>• Reduction in energy use in aquaculture will impact GHG emission.</li> <li>• Energy efficient tillage, postharvest management, storage (solar pump) driven by custom hiring of farm equipment will reduce fossil fuel use, contributing to climate mitigation.</li> <li>• Accelerated adoption of improved package of practices including climate smart technologies will drive reduction of non-CO<sub>2</sub> GHG emissions from agricultural practices and technologies i.e., direct seeded rice, alternate wetting and drying in rice, improving water use efficiency.</li> </ul>
<b>Component 3: Value Addition and Market Access (\$10.3m)</b>		
<b>Sub-Component 3.1 Value Addition for Nutrition (\$1.0m)</b>		
<ul style="list-style-type: none"> <li>• Promotion of energy efficient postharvest infrastructure (primary processing, preservation, storage and packaging).</li> <li>• Training of nutri-entrepreneurs in energy efficient value addition practices in food processing.</li> </ul>	<ul style="list-style-type: none"> <li>• Local value addition will increase dietary diversity, increased shelf life of food, and reduce food wastage thus and contribute to increased availability of nutritive food at household level thus supporting the households to overcome increasing food and nutrition security risks under climate shocks.</li> <li>• Increased capacity of local community on value addition technologies and practices will supporting the community to cope up with food/nutrition risks under climate shocks.</li> </ul>	<ul style="list-style-type: none"> <li>• Increased capacity of local entrepreneurs at village level and their access to energy- efficient processing technology will lead to accelerated adoption of solar dehydration technology and other renewable energy-based technologies in food processing including efficient cold storage. This will lead to reduced carbon emissions.</li> </ul>
<b>Sub-Component 3.2 Value Addition and Market Access (\$9.3m)</b>		
<ul style="list-style-type: none"> <li>• Capacity building of FPOs through TSAs on climate smart value chain development and climate-informed business plan development.</li> <li>• FPO business plans/investment proposals will be appraised for impact on climate change and build criteria</li> </ul>	<ul style="list-style-type: none"> <li>• Efficiency gain in aggregation, processing and marketing through FPO groupings of small producers will help communities to adopt improved practices and systems to address and manage emerging climate change risks (production, processing, logistics and marketing).</li> <li>• Resource efficiency in agricultural activities/processes and climate smart value chains</li> </ul>	<ul style="list-style-type: none"> <li>• Energy efficient and climate resilient postharvest, processing storage infrastructure and logistics at FPO levels i.e., solar-powered cold storage/equipment will improve energy efficiency</li> </ul>



Activities	Adaptation Actions	Mitigation Actions
<p>including lowering GHG intensity in rating and approval calculations.</p> <ul style="list-style-type: none"> <li>Farmer-level training and demonstration of climate-resilient postharvest technologies.</li> <li>Promotion of energy efficient postharvest infrastructure and technologies such as solar cold storage or solar-powered dryers (for food processing to reduce crop spoilage).</li> <li>Upgrading of rural market infrastructure and strengthening community capacities.</li> </ul>	<p>will inform climate-informed value-chain design such as multi-commodity approach, pre-identification of market players, and pre-contracting modalities in line productive alliance models and financing, enhancing communities' adaptation to climate shocks.</p> <ul style="list-style-type: none"> <li>Increased farmer capacity in climate-resilient technologies and practices such as improved post-harvest practices, energy efficient primary processing and storage will improve their ability to adapt to climate shocks.</li> <li>Increased private sector awareness on climate shocks and increased private sector investment in energy efficient processing technologies</li> </ul>	<p>downstream, leading to an overall reduction in GHG emissions.</p> <ul style="list-style-type: none"> <li>Energy efficient rural market infrastructure will improve energy efficiency downstream, leading to an overall reduction in GHG emissions.</li> </ul>
<b>Component 4: COVID-19 Economic Recovery Response (\$15.1m)</b>		
<ul style="list-style-type: none"> <li>Providing re-skilling and short-term work opportunities and restoring local livelihoods to returnee migrants around livestock management and natural resource management through entrepreneurship.</li> <li>Off-farm and non-farm entrepreneurial activities.</li> <li>Agriculture and horticulture input/production mini-kits.</li> <li>Wage generating land and water conservation-based activities.</li> </ul>	<ul style="list-style-type: none"> <li>Increased capacity of local community and improved local job opportunities (off farm/non-farm) will enhance communities' adaptation to climate shocks.</li> <li>Adoption of critical agri-/horti- production kits (seeds/planting material and other support material like organic composting) will enhance local food and nutrition security.</li> <li>Besides income security, land and water conservation activities (small ponds, rain-water harvesting, land levelling, solar pumps etc.) will contribute to reduced soil erosion, increased ground water recharge and irrigation, improving local food production.</li> </ul>	
<b>Component 5: Project Management, Monitoring and Knowledge (\$11.2m)</b>		
<b>Sub-Component 5.1: Project Monitoring and Management (\$10.7m)</b>		
<ul style="list-style-type: none"> <li>Baseline survey to capture existing level of availability, access, awareness and adoption of climate-resilient technologies and practices among project beneficiaries.</li> <li>Concurrent process monitoring and community-based participatory monitoring to capture adoption of climate-resilient practices to inform implementation.</li> <li>ICT-enabled customized MIS and geographic information system-based input-output monitoring system to generate monthly progress reports and indicators on climate risk mitigation activities and inform SPMU/ DPMU and BPIU decision-makers.</li> <li>Stand-alone studies to be commissioned on relevant climate change aspects.</li> </ul>	<ul style="list-style-type: none"> <li>SPMU will contract climate change experts to advise on adoption of adaptation and mitigation measures for all project activities and implement required training.</li> <li>Climate Risk Screen Tool will be integrated throughout project implementation to identify risks to the state in the agricultural sector and develop appropriate adaptation and crisis response plans.</li> <li>Early warning systems will be put in place to include climate impacts/factors and provide guidance/alerts for farmers to inform and adapt their crop choices and production decisions.</li> </ul>	<ul style="list-style-type: none"> <li>The project will focus on education, training, capacity-building and awareness-raising on climate change mitigation and initiate mitigation research (GHG emission in a few commodity value chains will be mapped to inform future interventions).</li> </ul>



Activities	Adaptation Actions	Mitigation Actions
<b>Sub-Component 5.2 Knowledge Management and State Capacity (\$0.5m)</b>		
<ul style="list-style-type: none"> <li>• Training and visits to other states/regions for staff of participating line departments to study potential of climate resilient technologies and practices.</li> <li>• Regular policy consultations with key state decision-makers to share learning from project implementation and inform decision-makers regarding policy support required to mainstream climate-resilient plans, processes and practices.</li> </ul>	<ul style="list-style-type: none"> <li>• SPMU will consist of policy experts who shall advocate and influence policy changes to support the state's climate-resilient agriculture.</li> <li>• National/global best practices on climate change adaptation technology/practices and stakeholder capacity building for accelerated adoption of such technologies/practices will be introduced.</li> </ul>	<ul style="list-style-type: none"> <li>• National/global best practices on climate change mitigation technology and stakeholder capacity building for accelerated adoption of such technologies/ practice will be introduced.</li> </ul>

### Part B: "Green House Gas Accounting"

An ex-ante GHG estimating analysis was carried out to ascertain the impact of project investments using the Food and Agriculture Organization on the United Nations Ex-Ante Carbon balance Tool (EX-ACT) which quantifies the net carbon balance in terms of tons of CO<sub>2</sub> equivalent (tCO<sub>2</sub>e), resulting from GHGs emitted or sequestered, as a result of project implementation compared to the 'without-project' scenario. The analysis was conducted in accordance with safeguards requirements and will help lower the project's carbon footprint, bringing both adaptation and mitigation benefits.

**Project characteristics.** The project implementation phase is 6 years and the capitalization phase is assumed to be 14 years, resulting in a 20-year implementation period which is common in the use of EX-ACT and aligned with the economic and financial analysis project period. During project consultations, it was assumed that the main benefits would come from adopting an IFS approach<sup>87</sup>. This is aligned with the landscape approaches, conservation agriculture principles<sup>88</sup> and globally promoted IFS for sustainable development. Furthermore, forest fringe areas offer additional opportunities for capitalizing natural resources, including rich biodiversity and intensifying production systems for year-round production of nutritive food for local consumption. The project will increase crop diversification and climate adaptive agriculture. By reclaiming degraded land and improving soil fertility, the project will expand and intensify production systems and improve productivity. Improved natural resource management and better crop planning will help optimize the use of agro-chemical inputs and their associated costs, thereby reducing the cost of production (see Table 3). In line with doubling farmers income, the project will promote value chains through FPOs, catering to local and distant markets. The ex-ante GHG emission estimates are based on detailed crop budgets prepared for key intervention areas and their impact was analyzed over a 20-year period.

**Table 3: Indicative improvement in management practices of production areas**

	WoP (ha)	WiP (ha)	Remarks/Assumptions
<b>Fruits</b>	0	500	Improved management in 70% of farm areas through improved agronomics, no residue/biomass burning, water and manure
<b>Vegetables</b>	4572	11430	

<sup>87</sup> focused on soil and water management integration of improved composting for building soil health, diversified *baadi*, promotion of animal husbandry with improved feeding practices, one health management practices, manure management etc., agroforestry systems and a range of climate smart agriculture practices.

<sup>88</sup> <http://www.fao.org/conservation-agriculture/en/>



Pulses and oil seeds	4572	9144	management.
Cereals	24,000	24,000	

For most crops, it is estimated that use of organic inputs and adoption of efficient application practices, would result in balanced usage of fertilizers, particularly N, P and K, and a decrease in the use of agrochemicals, thereby reducing GHG emissions (see Table 4). Similarly, in the dairy value chain activities improved feeding practices in at least 60% of the herd, would reduce net GHG emissions. Further, the bio-waste produced in *gauthans* will be converted into manure and other indigenous pest and nutrient management products supporting agriculture production. In the case of goat, pig and other small ruminant value-chains, it is estimated that there will be an increase in animal population due to reduction in mortality and improvement in management practices. Therefore, this will lead to an insignificant increase in GHG emission contributing to net GHG emission under the project scenario.

**Table 4: Assumptions for agriculture inputs usage under CHIRAAG**

Description	Unit	Without project	With project
Urea (Urea has 46.7% of N)	tonnes of N per year	2299	1889
Other N-fertilizers	tonnes of N per year	288	144
N-fertilizer in irrigated rice	tonnes of N per year	378	284
Sewage	tonnes of N per year	0	944
Compost	tonnes of N per year	0	196
Phosphorus	tonnes of P <sub>2</sub> O <sub>5</sub> per year	219	659
Potassium	tonnes of K <sub>2</sub> O per year	308	822
Herbicides	tonnes of active ingredient per year	0.6	1.2
Insecticides	tonnes of active ingredient per year	15.4	3.4
Fungicides	tonnes of active ingredient per year	8.5	17.1

Based on the above key assumptions, it is estimated that the project would result in decreased emissions of -686259 tCO<sub>2</sub>eq when compared to a normal baseline scenario over the next 14 years. This is equivalent to an annual decrease in GHG emissions/hectare/year of -0.6 tCO<sub>2</sub>eq and consequently, a moderate impact on GHG emissions (see Table 5 below and Graph 1 in page 22).

**Table 5: Annual and Total GHG Emissions with and without project and balance (tCO<sub>2</sub>eq)**

Project activities	Over the economic project lifetime (tCO <sub>2</sub> eq)			Annual average (tCO <sub>2</sub> eq/year)		
	GHG emissions (1)	Gross emissions (2)	Net GHG emissions (2-1)	GHG emissions (3)	Gross emissions (4)	Net GHG emissions (4-3)
Land use Changes Other LUC	0	-894,378	-894,378	0	-44,719	-44,719
<b>Agriculture</b>						
Annual	0	-698,737	-698,737	0	-34,937	-34,937
Perennial	-575,923	-801,775	<b>-225,852</b>	-28,796	-40,089	<b>-11,293</b>
<b>Grassland and Livestock</b>						
Livestock	0	998,447	998,447	0	49,922	49,922
Inputs	616,048	615,854	<b>-194</b>	30,802	30,793	<b>-10</b>
<b>Total</b>	<b>290,739</b>	<b>-497,143</b>	<b>-787,882</b>	<b>14,537</b>	<b>-24,857</b>	<b>-39,394</b>





ANNEX 7: Project Map

