



Project Identification Form (PIF) entry – Full Sized Project – GEF - 7

Transforming agricultural systems and strengthening local economies in high biodiversity areas of India through sustainable landscape management and public-private finance

Part I: Project Information

GEF ID

10204

Project Type

FSP

Type of Trust Fund

GET

Project Title

Transforming agricultural systems and strengthening local economies in high biodiversity areas of India through sustainable landscape management and public-private finance

Countries

India,

Agency(ies)

UNEP, IUCN

Other Executing Partner(s)	Executing Partner Type
----------------------------	------------------------

Ministry of Environment, Forest and Climate Change (MoEFCC); Ministry of Government
Agriculture and Farmers' Welfare (MoAFW); State Government of Karnataka; State
Government of Andhra Pradesh; Rainforest Alliance (RA); Rythu Sadhikara
Samstha (RySS)

GEF Focal Area

Multi Focal Area

Taxonomy

Agriculture and agrobiodiversity, Mainstreaming, Biodiversity, Focal Areas, Gender Equality, Land Degradation, Sustainable Land Management, Sustainable Agriculture, Sustainable Forest, Restoration and Rehabilitation of Degraded Lands, Improved Soil and Water Management Techniques, Ecosystem Approach, Land Degradation Neutrality, Land Cover and Land cover change, Land Productivity, Forestry - Including HCVF and REDD+, Influencing models, Strengthen institutional capacity and decision-making, Transform policy and regulatory environments, Deploy innovative financial instruments, Stakeholders, Local Communities, Private Sector, Financial intermediaries and market facilitators, Capital providers, Large corporations, Civil Society, Non-Governmental Organization, Gender Mainstreaming, Women groups, Sex-disaggregated indicators, Gender-sensitive indicators, Beneficiaries, Capacity, Knowledge and Research, Knowledge Exchange, Capacity Development, Knowledge Generation, Enabling Activities

Rio Markers**Climate Change Mitigation**

Climate Change Mitigation 1

Climate Change Adaptation

Climate Change Adaptation 1

Duration

60 In Months

Agency Fee(\$)

590,767

Submission Date

5/6/2019

A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
LD-1-1	GET	2,900,000	51,000,000
LD-3-4	GET	1,574,352	7,000,000
BD-1-1	GET	1,792,531	12,000,000
	Total Project Cost (\$)	6,266,883	70,000,000

B. Indicative Project description summary

Project Objective

To reduce land degradation and conserve biodiversity in agricultural landscapes in the states of Andhra Pradesh and Karnataka by promoting sustainable agricultural production, supply chains and public-private finance

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
1. Enabling institutional, fiscal, and strategic frameworks, at the national and state levels, that promote sustainable agriscapes contributing to LDN and biodiversity conservation	Technical Assistance	<p>At the national and state levels (priority agriscapes in Karnataka and Andhra Pradesh), the institutional, fiscal policy, and strategic planning frameworks are such that they enable transformation of agricultural systems and SLM at scale to reverse land degradation, improve community welfare and conserve biodiversity.</p> <p>Targets:</p> <ul style="list-style-type: none"> • Modified sectoral policies and investment plans on LDN and ZBNF • Landscape-level land use plans and governance structures validated for piloting in Karnataka and Andhra Pradesh covering 1.5 million ha 	<p>1.1 Proposals presented for reforms to integrate concerns of food security, land degradation and biodiversity conservation in the National Forest Policy, National Agroforestry Policy and other key policies. and for introducing mechanisms to implement and monitor LDN targets so that there is better integration and replication potential of existing 'sustainable' agriculture sector policy and institutional frameworks.</p> <p>1.2. Capacities established and institutional arrangements agreed for effective land use planning, and implementation guidelines at the landscape scale in Karnataka and Andhra Pradesh to promote SLM and biodiversity conservation in agriscapes, including off-farm protection of watersheds, biodiversity, high conservation value forest (HCVF), habitat connectivity, and ecosystem services.</p>	GET	589,023	4,949,374

2. Scaling up of sustainable agriculture and landscape management for attaining LDN, biodiversity conservation and inclusive economic growth among rural producers in priority agriscapes of Karnataka and Andhra Pradesh	Technical Assistance	<p>Sustainable agriculture and SLM approaches for attaining LDN, biodiversity conservation and inclusive economic growth are adopted by rural producers in priority agriscapes.</p> <p>Targets:</p> <ul style="list-style-type: none"> • (2.1 + 2.2 + 2.3) 1.5 million ha of agriscap (above baseline value) applying best management practices for LDN and biodiversity conservation: • (2.1) Over 1,450,000 ha under sustainable farming, ZBNF, agroforestry and diversified cropping systems; • (2.3) 20,000 ha SFM/reforestation & 30,000 ha HCVF protection for BD and ecosystem services. 	<p>2.1. Farm-level scale up of agricultural practices that are based on one or more locally-supported sustainability systems, particularly the Rainforest Alliance Sustainable Agriculture Standard (RA-SAS 200,000 ha), and Zero Budget Natural Farming (ZBNF 1,250,000 ha),</p> <p>2.2. Smallholders, company technicians, government extension services, and local CSOs are capable to lead on the adoption & replication of RA-SAS and ZBNF.</p> <p>2.3. Sustainable forest management and landscape restoration agreed and implemented through PPP and impact investments (through 3.2) for stable and productive agriscapes</p> <p>2.4: Best practices and innovations in agritech and digital information systems introduced and benefitting farmers, government and companies on upscaling and mainstreaming of sustainable agriculture.</p>	GET	3,038,233	19,050,626
---	----------------------	--	--	-----	-----------	------------

3. Market mechanisms and public-private finance for long-term adoption of SLM practices and increased investment in priority landscapes in the two project states	Technical Assistance	Market incentives for investing in sustainable commodities and value chains are strengthened and barriers to private finance are removed – contributing to adoption of ZBNF and sustainable farm management, SLM and LDN.	3.1: National and international markets leveraged to create incentives for investing in sustainable agriculture production and value chains – contributing to sustainable farm management, SLM and LDN	GET	1,561,783	44,000,000
		<p>Targets:</p> <ul style="list-style-type: none"> • New market opportunities enable an additional 150,000 tons of sustainable sourced coffee and spices. • 5 new companies make commitments to responsible sourcing • 1,750,000 farmers applying sustainable agriculture, including 1,500,000 on ZBNF, obtain positive benefit-cost ratio • US\$ 44 million from private blended finance invested in ZBNF and sustainable agriculture generate landscape-wide SLM through the private facilities • 5,000 farmers accessing financial services 	3.2: Portfolio of feasible impact investments developed with capital intermediaries and providers – combining investment in sustainable agricultural/ZBNF with SLM objectives in the priority landscapes.			
			3.3: Farmers benefitting with better access to capital by training of producer organizations (FPOs), CSOs and local social enterprises on accessing blended finance in the priority landscapes.			

4. Knowledge management and national outreach	Technical Assistance	<p>Evidence-based Monitoring, Evaluation & Learning (MEL) system that documents, analyses and disseminates effective intervention strategies for restoring productive landscapes and sustainable food systems to enable uptake and replication at national and state levels.</p> <p>Targets:</p> <ul style="list-style-type: none"> • One policy document in each state incorporates learning from the project • 20 media products discuss and disseminate project learning • Landscape-based ZBNF and sustainable agriculture replicated in at least one new State 	<p>4.1: MEL system implemented to track project progress and measure performance against targeted GEB and Core Indicators; as well as analyses of economics & scalability of ZBNF, and adoption of other best practices</p> <p>4.2: Communications campaign designed and implemented, including dissemination of best practices towards replication of agricultural practices that conserve biodiversity and reverse land degradation.</p>	GET	779,421	250,000
				Sub Total (\$)	5,968,460	68,250,000
Project Management Cost (PMC) ⓘ						
				GET	298,423	1,750,000
				Sub Total(\$)	298,423	1,750,000
				Total Project Cost(\$)	6,266,883	70,000,000

C. Indicative sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Government	MoEFCC	Grant	Recurrent expenditures	1,000,000
Government	MoEFCC	In-kind	Recurrent expenditures	1,000,000
Government	MoAFW	Grant	Recurrent expenditures	1,250,000
Government	MoAFW	In-kind	Recurrent expenditures	1,250,000
Government	Ministry of Rural Development	Grant	Recurrent expenditures	500,000
Government	Ministry of Rural Development	In-kind	Recurrent expenditures	500,000
Government	Ministry of Commerce and Industry	Grant	Recurrent expenditures	1,000,000
Government	Ministry of Commerce and Industry	In-kind	Recurrent expenditures	1,000,000
Government	State Government (Andhra Pradesh)	Grant	Recurrent expenditures	2,000,000
Government	State Government (Andhra Pradesh)	In-kind	Recurrent expenditures	2,000,000
Government	State Government (Karnataka)	Grant	Recurrent expenditures	1,250,000

Government	State Government (Karnataka)	In-kind	Recurrent expenditures	1,250,000
Private Sector	SIFF & BNP Paribas	Guarantee	Investment mobilized	20,250,000
Private Sector	SIFF & BNP Paribas	Equity	Investment mobilized	20,250,000
Private Sector	Rabobank-UN Environment Agri-3 Fund	Guarantee	Investment mobilized	1,750,000
Private Sector	Rabobank-UN Environment Agri-3 Fund	Equity	Investment mobilized	1,750,000
Private Sector	Various companies & blended private finance in key agricultural sectors	Guarantee	Investment mobilized	4,750,000
Private Sector	Various companies & blended private finance in key agricultural sectors	Equity	Investment mobilized	4,750,000
CSO	Rythu Sadhikara Samstha (RySS)	Grant	Investment mobilized	450,000
CSO	Rythu Sadhikara Samstha (RySS)	In-kind	Recurrent expenditures	450,000
CSO	Rainforest Alliance	Grant	Recurrent expenditures	700,000
CSO	Rainforest Alliance	In-kind	Recurrent expenditures	700,000
GEF Agency	UN Environment	In-kind	Recurrent expenditures	100,000
GEF Agency	IUCN	In-kind	Recurrent expenditures	100,000
			Total Project Cost(\$)	70,000,000

Describe how any "Investment Mobilized" was identified

All financing not covering ongoing recurrent expenditure were considered as investment mobilized

D. Indicative Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
UNEP	GET	India	Land Degradation	LD STAR Allocation	3,786,279	359,696	4,145,975
IUCN	GET	India	Land Degradation	LD STAR Allocation	688,073	61,927	750,000
UNEP	GET	India	Biodiversity	BD STAR Allocation	1,563,173	148,502	1,711,675
IUCN	GET	India	Biodiversity	BD STAR Allocation	229,358	20,642	250,000
Total GEF Resources(\$)					6,266,883	590,767	6,857,650

E. Project Preparation Grant (PPG)**PPG Amount (\$)**

130,000

PPG Agency Fee (\$)

12,350

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)
UNEP	GET	India	Land Degradation	LD STAR Allocation	95,000	9,025
UNEP	GET	India	Biodiversity	BD STAR Allocation	35,000	3,325
Total Project Costs(\$)					130,000	12,350

Core Indicators

Indicator 3 Area of land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
150000.00	0.00	0.00	0.00

Indicator 3.1 Area of degraded agricultural land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
130,000.00			

Indicator 3.2 Area of Forest and Forest Land restored

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
20,000.00			

Indicator 3.3 Area of natural grass and shrublands restored ⓘ

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 3.4 Area of wetlands (incl. estuaries, mangroves) restored ⓘ

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Indicator 4 Area of landscapes under improved practices (hectares; excluding protected areas) ⓘ

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
1850000.00	0.00	0.00	0.00

Indicator 4.1 Area of landscapes under improved management to benefit biodiversity (hectares, qualitative assessment, non-certified) ⓘ

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
350,000.00			

Indicator 4.2 Area of landscapes that meets national or international third party certification that incorporates biodiversity considerations (hectares) ⓘ

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

Type/Name of Third Party Certification

Rainforest Alliance PPG to set target on ha certified & confirm volumes traded

Indicator 4.3 Area of landscapes under sustainable land management in production systems ⓘ

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)

1,350,000.00

Indicator 4.4 Area of High Conservation Value Forest (HCVF) loss avoided ⓘ

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
150,000.00			

Documents (Please upload document(s) that justifies the HCVF)

Title	Submitted

Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment ⓘ

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	850,000			
Male	850,000			

Total	1700000	0	0	0
--------------	---------	---	---	---

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

The project will contribute to the following Aichi targets: Target 4: By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity Target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity Target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity Target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

Part II. Project Justification

1a. Project Description

Project Description

1) The global environmental problems, root causes and barriers that need to be addressed

India is one of the world's most biologically, ethnically and culturally diverse countries. It has also one of the lowest incomes per capita. The country supports approximately 16% of the world's human population and 20% of the world's livestock population on 2.5% of the world's geographical area. It has a total geographical area of 328.73 million hectares (mha), of which 141 mha is cultivated. The country has ten distinct biogeographic zones, including four biodiversity hotspots: the Himalayas, Indo-Burma, Western Ghats, and Sundaland.

The steady growth of human and livestock population, the widespread incidence of poverty, and the current phase of economic and trade liberalization are exerting heavy pressures on India's limited land resources for competing uses in forestry, agriculture, pastures, human settlements and industries. This, in turn, has led to a significant land degradation and biodiversity loss. Land degradation has compromised the government investments to increase agricultural productivity, improve soil and water conservation, and maintain forest cover. It is estimated that India lost 2.54% of its GDP in 2014/15 due to land degradation (82% on account of land degradation and 18% due to land use changes)[1]. According to the comprehensive Desertification and Land Degradation Atlas of India by the Space Applications Center (SAC Atlas 2016), 96.40 mha of land are nearly degraded, representing 29.32% of the total geographic area (TGA) of the country.^[2] The most significant cause of desertification/land degradation in the country is water erosion (10.98% in 2011-13 and 10.83% in 2003-05), followed by vegetation degradation (8.91% in 2011-13 and 8.60% in 2003-05), and wind erosion (5.55 % in 2011-13 and 5.58 % in 2003-05). Smallholders, marginal farmers and landless people are the most affected populations by land degradation due to limited skills and opportunities for adopting and practicing sustainable land management (SLM) practices.

Karnataka: agriculture, biodiversity and land degradation context

The state of Karnataka is located in the south western region of India and covers an area of 191,976 square kilometers (74,122 sq. mi), making it the sixth largest Indian state by area. With 61,130,704 inhabitants at the 2011 census, Karnataka is the eighth largest state by population, comprising 30 districts. It is the fifth-largest state economy with US\$200 billion in gross domestic product and a per capita GDP of US\$2,400[3].

Karnataka is situated on a tableland where the Western and Eastern Ghats converge into the Nilgiri Hills complex in the Deccan Plateau region of India with a rich biodiversity. The state has a recorded forest cover of 39,369 km² which constitutes 20.5% of the TGA of the state. These forests support 25% of the elephant and 18% of the tiger population of India. The Western Ghats, a biodiversity hotspot, includes the western region of Karnataka, including five National Parks -Anshi, Bandipur, Bannerghatta, Kudremukh and Nagarhole and 24 wildlife sanctuaries. The abundant biodiversity of the Western Ghats includes hundreds of medicinal plants of high value. Critically endangered flora in Karnataka include evergreen trees such as *Dipterocarpus bourdillonii*, *Hopea erosa* and *Hopea jacobi*, *Croton lawianus* (a small tree), and *Pinnatella limbata* (a moss). Other endangered trees include *Isonandra stocksii*, *Kingiodendron*

pinnatum, *Maesa velutina*, *Myristica magnifica*, *Rapanea striata* and *Xylosma latifolium*. Endangered fauna in Karnataka includes the tiger, the Indian elephant, the lion tailed macaque, the turtle and the Indian wild dog dhole (*Cuon alpinus*). Other multiple endangered species of wild fauna and flora are concentrated in this area.[4]

The geographic, physiographic, climatic and ecosystem diversity of Karnataka is reflected in the fact that it has 10 agroclimatic zones. Each of these zones comprises a combination of rainfall, seasons, soil type, crops grown and specific agroecosystems. Karnataka's economy largely depends on agriculture. It is the largest producer of coffee, raw silk, and sandalwood in the country. The state is adding considerably to the horticulture production of the country. Cultivated land in Karnataka constitutes 64.6% of the total geographical area of the state. Farmers and agricultural labor form 56.5% of the work force of Karnataka. Agriculture in Karnataka is heavily dependent on southwest monsoon.[5]

Karnataka is among the states with the highest desertification/land degradation level in India. About 54% of the area of the state is under cultivation (of which 13% is irrigated); 16% is under forests, and the remaining 30% is either left barren or is unculturable/ culturable wasteland. Water erosion is the primary cause of land degradation (26.29%), followed by vegetation degradation (8.93%), which has been a particular problem in the biodiversity hotspot of Western Ghats. As per the SAC study, Karnataka has about 36.24% of TGA under desertification/ land degradation for the period of 2011-13, an increase of about 0.05% since 2003-05. More than 75% of the entire geographical area of Karnataka witnesses arid or semi-arid climate. Karnataka has about 15% of the total semi-arid or 3% of the total arid areas marked in India.

Andhra Pradesh: agriculture, biodiversity and land degradation context

Andhra Pradesh (AP), situated in the south-east of the country, is the eight-largest state in India, covering an area of 160,205 km². It is the tenth most populous state, with 54 million inhabitants. AP has a coastline of 974 km – the second longest coastline among the states of India. The state is made up of the two major regions of Rayalaseema, in the inland southwestern part of the state, and Coastal Andhra to the east and northeast, bordering the Bay of Bengal. Of 13 districts, nine are located in Coastal AP and four in Rayalaseema. AP is the seventh-largest state economy in India with a GDP (2010) of US\$ 120 billion (per capita US\$ 2,000). AP hosted 121.8 million visitors in 2015, a 30% growth in tourist arrivals over the previous year, making it the third most-visited state in India.

The state has varied topography ranging from the hills of Eastern Ghats^[6] and Nallamala Hills to the shores of Bay of Bengal that support varied ecosystems, and a rich biodiversity. The Eastern Ghats are a major dividing line in the state's geography and become more pronounced towards the south and extreme north of the coast. Two main rivers -the Krishna and Godavari- flow through the state. The plains to the east of Eastern Ghats form the Eastern coastal plains, most of which are put to intense agricultural use. The Rayalaseema region has semi-arid conditions. Several critical water-ecosystems and wetlands are located in the state. They provide protective sanctuaries for migratory birds like flamingos and the Great Indian Bustard, which critically endangered.

The total forest cover of AP is 22,862 km², with the Eastern Ghats region being home to dense tropical forests. Among the flora, the state harbors a total of 2,800 taxa belonging to 1,050 genera under 185 families. AP is rich with 108 species of mammals, which include Elephant, Tiger, Leopard, Sloth Bear, Giant Squirrel, Hyena, Fox, Wild Dog, Wild Boar, Indian Bison (Gaur), Spotted Deer, Barking Deer, Black Buck, Four-horned Antelope, Blue Bull, Sambar, Mouse Deer, Honey Badger, Civets, Jungle Cats, Otter, Pangolin, Bats, Dolphins, Whales, Tree Shrew, Common Langur and Slender Loris. It is a prominent center of diversity for cultivated crop plants, having more than 33 wild ancestors and close relatives of cultivated plants still growing under natural conditions. It is also the origin of two indigenous cow breeds, the Ongole and Krishna Valley breeds. The state is rich in a variety of medicinal and aromatic plants and 1,800 species of such plants are cultivated on about 10,000 ha in the state. The state is estimated to have lost 30-40% of its biodiversity in recent decades due to human activity.

The state is divided into nine agroclimatic regions, and agriculture plays an important role not only in the economy – 30% of GDP- but also for achieving food security for the country. The sector is vital for livelihoods, as 63% of the population in AP live in rural areas and depend on agriculture and related livelihood opportunities.

According to the SAC data, 14.35% of the state's TGA is under desertification/land degradation (2011 –13, a 0.19% increase since 2003 –05). The most significant process of desertification/land degradation is Vegetation Degradation (7.27% in 2011 – 13 and 7.29% in 2003 – 05), followed by Water Erosion (4.93% in 2011 – 13 and 4.899% in 2003 – 05). Vegetation degradation is observed mainly as deforestation/forest-blanks/shifting cultivation and degradation in grazing grassland as well as scrubland. Destruction of vegetation, most often by human activities, has accelerated soil degradation and desertification.

Threats and root causes

While India's Green Revolution increased agricultural production overall, it heavily relied on capacity to install irrigation systems, apply agrochemicals, and acquire high-yielding seeds. Smallholders in rain-fed and resource poor areas have continued to suffer diminishing yields, shrinking profits, decreasing soil quality, lowered groundwater tables, and spiraling debts. Agriculture in its current form requires farmers to rely heavily on inorganic external inputs such as chemical fertilizers and pesticides. These contaminate groundwater and other water-dependent ecosystems, reduce soil fertility as well as soil health over time and contribute to biodiversity loss in farmlands. Excessive irrigation, erosion, loss of riparian tree cover, siltation, and leachates from nitrogen and synthetic chemicals pose significant risks to India' aquatic biodiversity.

The use of external inputs by adoption of uniform hybridized, and genetically modified crop varieties erodes genetic diversity of seeds, and not only reduces farmers' ability to adapt to changing climatic conditions but also exposes smallholder farmers to a high degree of credit risk and traps them in a perpetual cycle of debt[7]. An agricultural system with such exposure to risk favors large scale farming at the expense of smallholders.

The use of non-indigenous seeds increases the chances of loss of local species. In Karnataka, intensive agriculture through introduction of high yielding varieties (HYV) has reduced the area for traditional varieties and led to the extinction of several local crops. The conventional farming methods have also resulted in less livestock on the farms, as traditional manure application is no longer needed, leading to the reduction of the population of indigenous cow breed numbers on farms. For example, Krishna Valley cow breed has only a few hundred remaining (90% decline).

Karnataka's State of the Environment Report (2011) notes that injudicious use of irrigation has resulted in land degradation caused by acidity, alkalinity, leaching of nutrients and pesticide residues threatening groundwater quality, while the key threat to biodiversity has been habitat destruction due to expansion of agriculture as one of the fueling factors. The use of often excessively high levels of agro-chemical inputs has exposed smallholder farmers in AP to a high degree of credit risk keeping them in a perpetual cycle of debt. Farmer households in AP have the highest prevalence of indebtedness in the country.[8] An agricultural system with such exposure to risk favors large scale farming. For AP, with 63% of the population reliant on agriculture and agriculture accounting for 30% of the state GDP, the other challenges are growing water scarcity, degrading natural resources and decreasing per capita availability of land and water resources. This translates into a critical area of concern for the future food security and environmental stability.

Sustainable Agriculture Standard and Zero Budget Natural Farming

For India to achieve stable, long-term agricultural growth that slows biodiversity loss and land degradation, while also providing viable employment for its rural population, alternative low-input farming practices are required on a large scale. Financial and commodity markets can create opportunity for farmers to apply new technologies that secure their incomes, reduce GHG emissions and other environmental impacts, and make farms more resilient to climate change

effects. Two particularly promising and related approaches are (i) the market-driven application of sustainable agriculture practices that can lead to Rainforest Alliance certification; and (ii) Zero Budget Natural Farming (ZBNF), a system of low-input, climate-resilient farming that encourages farmers to use low-cost, locally-sourced inputs, eliminating the use of artificial fertilizers, and industrial pesticides.

The practice of intercropping is encouraged under the Rainforest Alliance standards of best practice and ZBNF, which ensures that vulnerable communities have access to a suite of nutritional sources and income-generating crops throughout the year. Farmers are encouraged to plant trees in the same plot of land. Agroforestry not only improves the productivity of the land, but also plays a pivotal role in landscape restoration and prevention of biodiversity loss. Locally-adapted crops and livestock breeds also require fewer inputs – inputs that often pose threats to biodiversity[9].

ZBNF is a concept rooted in India villages. It has grown over the last fifteen year to reach half a million farmers in 3,000 villages. Its four objectives are: (1) Improved farmers' welfare through lower costs and risks, higher yields and climate change resilience; (2) Reduced hunger, resulting from more safe and nutritious food; (3) Wellbeing of India's youth, so that they stop migrating to cities; and (4) Conservation of the environment- soil health, water conservation, regenerated ecosystem and biodiversity conservation. Unlike the Green Revolution, ZBNF bases its approach on enhancing soil biology, in line with the soil web of the United States Department of Agriculture[10]. It promotes use of cover crops, botanical extracts for pest management; minimal tillage; and local village production of all inputs. The government of Andhra Pradesh aims to extend ZBNF to six million farmers in the state.

Sustainable agriculture and ZBNF could therefore form a vital part of a long-term strategy to address the causes of biodiversity loss and land degradation from the agriculture sector. However, there exist a number of barriers to transformative-scale uptake of these initiatives.

Barrier 1: Inadequate integration of environmental and social sustainability concerns in agriculture sector policy and institutional framework

The Government of India is committed to promoting the achievement of global biodiversity objectives. However, the existing governance system for agriculture hinders progress. There is limited experience with the integration of biodiversity conservation, land degradation, climate-change mitigation (CCM), and sustainable forest management (SFM) issues within agricultural policies and related institutional frameworks. Under the current situation, the agricultural governance framework is focused on production, without adequate environmental or conservation safeguards. Agricultural investments and support systems are not directed towards the promotion of ecosystem-based solutions. Removing this barrier requires building the capacity of decision-makers at all levels, to mainstream global conservation values within agriculture.

Since the 1950s, India has committed to investment in the agriculture sector to support rural employment, economic growth and food security for a growing population. Central and State policies and associated programmes and investments continue to reflect this mandate. These policies have led to substantial increases in agricultural production, but often at the cost of increased environmental consequences. Production of key agricultural commodities is largely driven by price supports and market demand rather than agro-climates and other environmental parameters. Most policies strongly encourage production of a narrow range of crops that require significant inputs. For example, farmers grow heavily irrigated crops in very arid regions as a result of political guarantees of free or nearly free electricity for groundwater extraction and inexpensive or free access to water.

Institutional frameworks need to align at national, state, and local levels to achieve coordination of agricultural production with global conservation objectives. For example, the agricultural departments provide extension services on farm related approaches and best practices, whereas issues relating to land management and watershed treatments are dealt by the Department of Land Resources (DoLR) housed in the Ministry of Rural Development. Issues and obligations under the UNCCD are housed within the Ministry of Environment, Forest and Climate Change (MoEFCC) with a specific Desertification Cell. Parts of the lands belonging to Village Panchayats fall under the overall jurisdiction of the Panchayati Raj Institutions (PRI). At the same time, various categories of forestlands, including severely degraded ones, are managed by the forest departments. Such an institutional complexity within a contiguous landscape having

lands undergoing various degrees of degradation poses a challenge to implement measures to arrest or reverse land degradation. A streamlining approach is required to help to converge the products and support from multiple institutions to address the issues of land degradation and desertification at a landscape-level approach.

Barrier 2: Lack of practical experience and proof-of-concept for transformational change towards farm and landscape level sustainable agricultural production and supply chains

India has extensive programs promoting SFM, and a well-established network of agricultural extension officers. Andhra Pradesh and other states have thousands of hectares under non-pesticide management production systems. However, India continues to struggle to create working examples of agriculture that more fully integrate environmental concerns and efforts strategically aligned to deliver ecosystem-based solutions, which can inform national and state policies and be implemented at a landscape scale:

- Agricultural support and extension services are not designed to deliver tangible conservation impacts to support the ecological integrity of biodiverse landscapes. India does not have integrated, replicable examples of farmers working together to build consensus and strategically align individual production practices that are compatible with specific biodiversity conservation objectives.
- Farmers living in biodiverse agriscapes have little incentive or access to the tools and financing to shift current practices towards more sustainable models; they are risk-averse when it comes to adoption of new practices that may result in a temporary decrease in production.
- Extension officers and support institutions do not have the tools and capacities to equip farmers with the understanding required to support agricultural production and maintenance of ecosystem services. India's extension services are still predominantly modelled as means of input supply. Extension emphasizes production and productivity. Success indicators and targets for extension officers' performance relate to amounts of inputs dispersed rather than to social or ecological results.
- The Farmer Field School (FFS) approach is used in parts of India. However, existing FFS models are generally not designed to support farmers in areas of highest ecological value to work towards the promotion of long-term biodiversity benefits and do not work to coordinate farm-level efforts across an entire ecosystem or landscape.
- India has not yet adopted viable models for capturing and upscaling climate-smart agricultural practices and embedding them within institutional frameworks. Farm-level evidence on the achievement of conservation objectives has not yet been aggregated into a coherent mosaic with clear justifications for urgently needed policy transformations. Because demonstrations of best practices do not exist at scale, there is little ability to monitor results and to use these results to inform national and state policies that drive agricultural investments.

Barrier 3: Poorly developed markets and financial services for sustainably produced agricultural commodities and for the environmental co-benefits of SLM

To apply SLM at scale, India's agricultural producers must have the means and the motivation such as accessing markets that recognize and reward sustainable management practices and financing mechanisms that enable them to invest in applying technologies and restoring degraded land. Examples of private sector initiatives include commitments by companies belonging to the Consumer Goods Forum in 2010 to remove deforestation from their supply chains of palm oil, soy, cattle and pulp and paper, and the launch of the Global Agribusiness Alliance in 2016.¹¹¹ The companies in India, however, have not been following the momentum and even the Indian branches of international companies are not involved in such initiatives. The potential for positive impact at scale is substantial if the market sends the signal and it is followed by making technical and financial services available.

Financial markets have shown some positive developments in the last few years, with new financing mechanisms coming up to channel investment into SLM. For example, the Rabobank-UN Environment Agri-3 Fund facility announced in November 2017 aims to finance sustainable agriculture and land use and help achieve the Paris Climate Agreement and Sustainable Development Goals. It has the potential to channel public and private investment into transformational land use at scale. While mechanisms and investors exist, the investment case for SLM adoption has not been adequately made and used as the basis for negotiating with investors. Moreover, debt-service is a barrier for government institutions to be able to effectively tap in to such financing.

The absence of financial incentives at the farm level also poses a barrier. Smallholders do not have the capacity to develop business plans and usually lack the collateral to access financial services. Markets may not reward farmers' investments in SLM by paying premiums. Crop diversification requires investment to develop a market for new crops. Collectivization in marketing can be the solution whereby more bargaining power will be brought to the farmer and provide additional income through value additions. Building these collective institutions requires specialized training. There is also a need for the creation of more transparent supply chains, especially from the perspective of providing training geared towards meeting the requirements of better-quality standards and traceability requirements of certification.

Barrier 4: Limited knowledge management for learning, validation and scaling up of good practices and feeding in to policy change

Where successes have been achieved in SLM that deliver benefits to farmers and reverse the trend of land degradation, they need to be shared widely and access to learning by other farmers facilitated. Such mechanisms are limited and information generated is not easily accessible across government agencies to inform other projects. The Government of India is still in the process of adopting viable models for capturing and upscaling best practices and success stories and embedding them within institutional frameworks.

The lack of scientific, verified evidence, in wide circulation, of the benefits of sustainable agriculture, including ZBNF, poses a challenge. For example, the erosion of topsoil strips the land of essential nutrients like moisture, nitrogen and phosphorus, requiring the fallowing of land to recharge some of those nutrients through natural processes. Under conventional farming, the numbers of soil fauna and other micro-organisms such as beneficial fungi are degraded due to the application of synthetic fertilizers and pesticides, while under a sustainable system the bio-organic mixtures are focused on enhancing soil microbial content that leads not only to better soil fertility, but also strengthened water retention capacity, allowing resilience in farms during periods of droughts. Initial reports need to be validated by scientifically assessing the change in soil quality after transition; the improvements in cost/benefit to farmers, as well as the general contribution to improved land management, resilience and GEBs. Scientific assessment and validation of the environmental and developmental benefits of sustainable agriculture including ZBNF is essential for convincing and attracting impact investors. It is also needed to advocate for adoption by other states and to build a case to the central government for implementing sustainable agriculture/ZBNF nation-wide.

2) The baseline scenario and any associated baseline projects

In the absence of a GEF intervention, conventional farming will continue, while the government support to natural farming under annual state government budgets will not reach its scale to make a transformative impact^[12] on halting and reversing land degradation and conserving biodiversity. Efforts to scale up sustainable agriculture, including ZBNF, will be slowed due lack of proper analysis and dissemination of the positive impacts. Local initiatives, for example in organic farming, will continue but at limited scale. It is only by bringing the powerful leverage of the market and private investment that transformative-scale change can occur.

Government of India baseline (central level)

Gol has made extensive investments in the improvement of both environmental conservation and agricultural sustainability.^[13]

The central plan outlay for MoAFW is US\$ 1.6 billion. In addition, the Union budget includes investments of approximately US\$ 3.9 billion for the Rural Infrastructure Development Fund, US\$ 231 million for the long-term rural credit fund, US\$ 6.93 billion for the short-term cooperative rural credit finance fund, and US\$ 3.85 billion for the short-term Regional Rural Bank (RRB) refinance fund. The target for agricultural credit investment is approximately US\$ 130.9 billion. Additionally, several national missions provide strong baseline programs to the proposed GEF project:

National Mission for Sustainable Agriculture (NMSA), 2014/15 budget allocation: US\$ 316M. As the primary baseline programme for the proposed programmatic approach, NMSA seeks to transform Indian agriculture into a climate-resilient production system through suitable adaptation and mitigation measures in the domain of crops and animal husbandry. NMSA has four primary programmatic areas: (i) rain-fed area development, (ii) on-farm water management, (iii) soil health management, and (iv) climate change and sustainable agriculture—monitoring, modelling, and networking.

Traditional Agriculture Development Programme (Paramparagat Krishi Vikas Pariyojana), 2015/16 budget allocation: US\$ 50M. This initiative promotes (i) organic farming, (ii) eco-friendly forms of cultivation that reduce dependency on agro-chemicals and fertilizers, and (iii) more efficient and widespread utilization of locally available natural resources.

National Mission for a Green India (GIM), 2014/15 budget allocation: US\$ 13.3M. GIM aims to address climate change by (i) enhancing carbon sinks in sustainably managed forests and ecosystems, (ii) enhancing the resilience and ability of vulnerable species/ ecosystems to adapt to the changing climate, and (iii) enabling adaptation of forest-dependent local communities in the face of climatic variability.

National Initiative on Climate-resilient Agriculture (NICRA), 2014/15 budget allocation: US\$ 16.7M. Initiated by ICAR in the 2010/11 budget cycle, NICRA aims to enhance the resilience of agricultural production to climate variability in vulnerable regions

Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). This act aims to enhance the security of the livelihoods of rural poor by guaranteeing 100 days of wage employment to a rural household whose adult members volunteer for manual work. In addition to generating employment, MGNREGA also works towards asset creation in rural areas, both for community benefit and individual livelihood support.

The central plan outlay of the MoEFCC is approximately US\$ 252 million. Total estimated funding for biodiversity conservation during 2013-2014 in India was approximately USD 1,482.68 million, spread across 23 Ministries and Departments, and over 77 schemes. The budgetary allocation of MoEFCC has increased from USD 96.55 million in 1992-1993 to US\$ 477.59 million in 2013-14. (See Annex D for details on relevant union-level baseline programs/missions).

Annex D

RELEVANT NATIONAL-LEVEL BASELINE MISSIONS/INITIATIVES/SCHEMES

Community forest management is supported through the joint forest management (JFM) initiative, which now extends to all states, with about 120,000 JFM committees involving about 14.5 million families managing over 20 mha of forest. Certification is managed by the Indian Institute of Forest Management (IIFM). Gol additionally funds large-scale central programs such as RKVY (the National Agriculture Development Program; 2014/15 budget allocation: 9,864 crore ≈ \$1.64 billion), the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA; 2014/15 budget allocation: 33,353 crore ≈ \$5.60 billion)

the National Food Security Act (NFSA; 2014/15 budget allocation: 102,000 crore \approx \$17 billion), and the Integrated Watershed Management Programme (IWMP; 2014/15 budget allocation: 3,464 crore \approx \$577M).

National Mission for Sustainable Agriculture (NMSA). (2014/15 budget allocation: US\$ 316M) As the primary baseline program for the proposed programmatic approach, NMSA seeks to transform Indian agriculture into a climate-resilient production system through suitable adaptation and mitigation measures in the domain of crops and animal husbandry. NMSA has four primary programmatic areas, with which the project will align: (i) rain-fed area development, (ii) on-farm water management, (iii) soil health management, and (iv) climate change and sustainable agriculture—monitoring, modelling, and networking. NMSA addresses these areas via research and development activities, absorption of improved technology and best practices, creation of physical and financial infrastructure and institutional framework, facilitating access to information, and promoting capacity building.

National Mission for Integrated Development of Horticulture (NMIDH). (2014/15 budget allocation: US\$ 367M) NMIDH aims to provide holistic growth of the horticultural sector through regionally differentiated strategies that include research, technology promotion, extension, post-harvest management, processing, and marketing, in consonance with comparative advantages of each state/ region and its diverse agro-climatic features. It has a strong focus on nutritional security, and opportunities for employment for skilled and unskilled persons, especially unemployed youth. NMIDH also promotes multi-purpose tree species in order to contribute, inter alia, to GHG sinks and livelihood diversification.

National Mission for a Green India (GIM). (2014/15 budget allocation: US\$ 13.3M) GIM aims to address climate change by (i) enhancing carbon sinks in sustainably managed forests and ecosystems, (ii) enhancing the resilience and ability of vulnerable species/ ecosystems to adapt to the changing climate, and (iii) enabling adaptation of forest-dependent local communities in the face of climatic variability. There are three main objectives of the mission: (i) to increase forest/tree cover to the extent of 5 million hectares (mha) and improve quality of forest/tree cover on another 5 mha of forest/non-forest lands (ii) to improve/enhance eco-system services like carbon sequestration and storage (in forests and other ecosystems), hydrological services and biodiversity; along with provisioning services like fuel, fodder, and timber and non-timber forest products (NTFPs); and (iii) to increase forest based livelihood income of about 3 million households. .

National Initiative on Climate-resilient Agriculture (NICRA). (2014/15 budget allocation: US\$ 16.7M) Initiated by ICAR in the 2010/11 budget cycle, NICRA aims to enhance the resilience of agricultural production to climate variability in vulnerable regions by (i) enhancing the climate resilience of Indian agriculture via improved production and risk management technologies, (ii) demonstrating site-specific technological packages on farmers' fields for adapting to current climate risks, and (iii) enhancing the capacity-building of scientists and other stakeholders in climate-resilient agricultural research and its applications. The project comprises (i) strategic research on adaptation and mitigation, (ii) demonstrations on farmers' fields of technologies to cope with current climate variability, (iii) sponsored and competitive research grants to fill critical research gaps, and (iv) capacity-building for various stakeholders.

Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). This act aims to enhance the security of the livelihoods of rural poor by guaranteeing 100 days of wage employment to a rural household whose adult members volunteer for manual work. In addition to generating employment, MGNREGA also works towards asset creation in rural areas, both for community benefit and individual livelihood support. MoAFW targets the agricultural sector with schemes and programs that typically benefit individual farmers, though there are certain interventions that collectively benefit farming communities. Thus, MGNREGA has a high degree of convergence with agricultural initiatives and with the sorts of labor-intensive capital investments that will be supported by certain initiatives within this proposed GEF projects (e.g., earthworks for reduced erosion). MGNREGA also has a functional system for direct payments to rural households.

-End of Annex D-

Government of India baseline (state level)

At state level, government initiatives include **Andhra Pradesh's** Swarnandhra Vision-2029 to move towards double digit growth adopting best practices to boost up productivity and improve livelihoods of small and marginal farmers through science-led scaling-up process. The strategy covers agriculture, horticulture, livestock and fisheries sector. In the 2018-19 budget, the state has allocated Rupees 10,097 crore (4.7% of its total budget) towards agriculture and allied activities. This includes Rupees 4,100 crore allocated for providing debt waiver to farmers, and Rupees 1,102 crore allocated for Pradhan Mantri Krishi Sinchayi Yojana (micro irrigation).

In the past few years, the Government of Andhra Pradesh (GoAP) has taken a number of measures and initiatives to support the transition towards sustainable agriculture. In 2015, it institutionalized the Rythu Sadhikara Samstha (RySS), a state-owned, non-profit organization, to introduce ZBNF practices to all farmers in the state. In addition to the funds assigned by GoAP, support from Azim Premji Philanthropic Initiatives (APPI) has enabled the roll-out of ZBNF to 138,000 farmers across all districts of AP, bringing 60,000 ha under the ZBNF model of agriculture. The GoAP and RySS have used a decentralized cluster model to identify, mobilize, and train 'master farmers' to lead dissemination to communities. GoAP, through RySS, officially launched the scaling-out of ZBNF to 6 million farmers by 2025 in June 2018. On the same date a Memorandum of Understanding between GoAP and the Sustainable India Finance Facility (SIFF) was signed. The SIFF is an innovative partnership facilitated by the United Nations Environment Programme, World Agroforestry Centre and BNP Paribas aimed to bring long-term blended finance to projects and companies that stimulate green growth, increase resilience, reduce GHG emissions and improve rural livelihoods.

The **Government of Karnataka**, recognizing the importance of organic agriculture, brought out a State Policy on Organic Farming in 2004 and has implemented several schemes and programmes since then to promote organic farming in the state. The State government has recently launched the 'Karnataka Organic Farming Policy 2017', in order to enable the next level of development in organic farming. This policy aims to bring organic farming into the mainstream and transform agriculture in Karnataka into a sustainable remunerative occupation enabling production of nutritious food by promoting eco-friendly organic farming and marketing systems and focuses on conservation and management of soil and water and agri-ecosystems, improvement of supply chain and infrastructure for post-harvest.

The Savayava Bhagya Yojane is an ambitious project of the Karnataka government since 2013-14, being implemented in coordination with NGOs selected transparently through e-tendering. The selected NGO has been entrusted with the task of adopting 100 hectares of area in each hobli (cluster of villages, an administrative unit), helping farmers to form organic farmer associations. Currently, this project is under implementation in an area of 63,677 hectares, involving 53,829 farmers.

The Market Based Specific Crop Organic Cluster Development Programme is being implemented from 2017-18 under the Savayava BhagyaYojane project areas with a focus on market based specific crops or commodity in order to provide the required bulk & continuous supply to meet the market demand.

The state has also initiated the implementation of the Centrally Sponsored scheme "Paramparagata Krishi Vikasa Yojana (PKVY)" since 2015-16. The programme is implemented in all the districts and taluks of Karnataka in project areas of 50 acres (clusters) each. A total of 545 crop-specific organic clusters at 3 clusters/taluk have been selected throughout the state covering an area of 27,250 acres benefiting 25,968 farmers in the state. The project areas are registered under Participatory Guarantee System (PGS) of certification is adopted in PKVY implementation area.

The “Karnataka Forest Department Strategy” released in 2017 aims to increase forest and tree cover in Karnataka to 30% of the State’s land. Currently, Karnataka has 21.88% green cover, which reflects a shortage of 21,957 hectares. Karnataka’s strategy for enhancing forest and tree cover includes conserving and developing forests in the Recorded Forest Area (RFA), where the scope for enhancement is low.

Private sector baseline

Companies producing coffee in India and buying Indian coffee in the international market are investing in sustainability through their commitments to Rainforest Alliance certification or to a similar set of sustainable production practices. These investments cover the costs of implementing sustainable practices, undergoing a certification audit and establishing a traceability system. 69% of India’s coffee is produced in Karnataka (55% of coffee production land)[14]. An estimated 22,000 tons of coffee produced in the state by over 2,000 producers on around 50,000 ha is certified and sold mostly into international markets[15]. Nescafé, the world’s largest coffee brand, has production facilities in Karnataka and is operating its sustainability program called Farmer Connect in India, whereby it trains farmers supplying to its factory in sustainable agricultural practices. India’s largest retail coffee chain, Café Coffee Day, with 1,482 coffee shop outlets and 530 express points, grows and processes coffee in Karnataka and has certified all 18 of its coffee estates with Rainforest Alliance.

India is the world’s largest producer and exporter of spices. Andhra Pradesh is the second largest producing state and Karnataka the fifth. The industry is stepping up its commitments to sustainability in response to market demand. The largest global spice buyer, McCormick, has a major public commitment to responsible sourcing, including certification. It has a joint venture in India with AV Thomas, called AVT McCormick, which is one of over 20 companies certifying spices according to the Rainforest Alliance standard. Other large investors in certified spice production include Griffith Foods, Tata and Swani Spice Mills. In collaboration with the Sustainable Trade Initiative (IDH), several large spice companies have joined the Sustainable Spice Initiative, which provides a forum for engagement by the project to build further knowledge and commitment of the value of SLM in spice production. Notwithstanding, the commitments have not been scaled up to the degree that has had an impact at a landscape scale and require further catalyzing and cooperation with, including the need to engage financial institutions for scale up.

Civil society baseline

Numerous CSOs work across the agricultural and natural resource management sectors, offering a rich array of potential execution partners. The Indian Institute of Plantation Management (IIPM), based in Bengaluru, is a well-established and respected research and technical organization, which works closely with the Indian Coffee Board. BAIF Development Research Foundation helps provide sustainable livelihoods to the rural poor through climate-resilient agriculture, management of natural resources, livestock development, watershed development, and mixed systems of agriculture, horticulture, forestry, and livestock management. PRADAN promotes the livelihoods of rural poor people via socio-behavioral, technical, and managerial initiatives. PRADAN promotes self-help groups, forest-based livelihoods, natural resource management, livestock development, and micro-enterprises.

The Centre for Sustainable Agriculture (CSA) in Hyderabad is a professional resource organization that establishes models of sustainable agriculture in partnership with NGOs, CSOs, and policy-makers to scale up successes. CSA’s works on various aspects of land-use management, including sustainable production, green enterprises, and farmers’ institutions. The Nature Conservation Foundation (NCF) improves the knowledge and conservation of India’s unique and ecologically diverse wildlife heritage, in part, by conducting research on resource uses and related effects on wildlife and ecosystems. NCF uses

this knowledge in collaboration with local communities to design locally appropriate conservation strategies. Of the 38 IUCN members in India, more than 30 have a direct strong role to play towards protecting and conserving environment as part of their mandate. IUCN members include well-known environmental organizations such as WWF, Wildlife Trust of India (WTI), Salim Ali Centre for Ornithology and Natural History (SACON), Foundation for Ecological Security (FES), Development Alternatives (DA), and Bombay Natural History Society (BNHS) among others. Specific programme investments and budgets available through CSO baseline programmes will be confirmed during the PPG design as part of the stakeholder analysis.

3) The proposed alternative scenario with a brief description of expected outcomes and components of the project

The alternative scenario under GEF7 will see a transformation of land management into sustainable agricultural systems, land degradation neutrality, biodiversity conservation and rural economic development in two priority states – Karnataka and Andhra Pradesh (see Annex B for further details on the project's target areas). At the farm-level, the project will build commitment to sustainable farming by demonstrating a positive benefit-cost ratio for farmers, enabling their access to technical and financial services and generating market commitment to source sustainably produced commodities. In the wider landscape, the project will facilitate effective participatory governance to plan and manage land use in forested, fallow, and productive areas through conservation and optimization of ecosystem service flows from biodiverse areas around farmlands, SLM, and restoration. The governance process will 1) assess options and outcomes at the relevant scale that takes into consideration the linkages between landscape components; 2) establish inclusive dialogue between stakeholders for participatory decision making and; 3) establish effective institutional mechanisms to coordinate actions across the landscape and manage trade-offs and negotiation between stakeholders.

The project objective is “to reduce land degradation and conserve biodiversity in agricultural landscapes in the states of Andhra Pradesh and Karnataka by promoting sustainable agricultural production, supply chains and public-private finance”. This objective will be pursued through the four components described below.

Component 1: Enabling institutional structures, fiscal policies, and strategic coordination at the national and state levels, that promote sustainable agriscapes^[16] contributing to LDN and biodiversity conservation

The outcome of this component is that ‘At the national and state levels (priority agriscapes in Karnataka and Andhra Pradesh), the institutional structures, fiscal policies, and strategic planning processes are reviewed and strengthened where necessary to enable transformation of agricultural systems and sustainable land management (SLM) at scale to reverse land degradation, improve community welfare and conserve ‘.

Output 1.1: *Proposals presented for reforms to integrate concerns of food security, land degradation and biodiversity conservation in the National Forest Policy, National Agroforestry Policy and other key policies. and for introducing mechanisms to implement and monitor LDN targets so that there is better integration and replication potential of o existing ‘sustainable’ agriculture sector policy and institutional frameworks.*

India has set restoration targets within the framework of the Bonn Challenge as follows: to bring into restoration 13 million ha by 2020 and a further 8 million ha by 2030 (estimated economic benefit of \$6.5 billion and carbon sequestration benefit of 1.99 GtCO₂^[17]). Under this component, the project will work with the responsible government agencies and specialist partners to ensure that government policies, procedures and measurement mechanisms necessary to implement and monitor the restoration targets are in place. The project will seek to facilitate alignment of India's National Action Programme under the UNCCD with the criteria of the Land Degradation Neutrality Fund^[18], and in that way facilitate potential financing opportunities. The project would also be one

of the transformational projects in line with India's soon to be established LDN targets under UNCCD. Further, as highlighted earlier, inadequate integration of environmental and social sustainability concerns in agriculture sector policy and institutional frameworks are barriers that need to be addressed (see barrier 1), and this will be a focus of Output 1.1. Examples of the limited coordination in an extensive policy framework are provided below; this would form the basis for discussions with stakeholders during the project preparation phase to define project interventions under this component:

- The National Food Security Act (NFSA) guarantees the purchase and price of only wheat, rice, and coarse grains, rather than supporting various national strategies for nutrition, soil health, water security, biodiversity, and financial sustainability. Fertilizer subsidies are usually not paid directly to farmers. However, the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), which facilitates employment of rural labor for rural development projects and includes a mechanism for direct payments, has increased efficiencies, reduced leakages, improved transparency and accountability, provided faster payments to beneficiaries and reduced opportunities for beneficiary fraud.

- The National Mission on Sustainable Agriculture (NMSA) advocates strategies for India to achieve co-benefits between climate change mitigation and adaptation. Part of this effort is to integrate with National Missions on Water, Green India, Enhanced Energy Efficiency, Solar, and Climate Change. NMSA calls for a multi-stakeholder committee to coordinate and support its implementation, but NMSA does not integrate issues pertaining to biodiversity.

- Agrobiodiversity can deliver substantial environmental benefits with traditional crops and livestock varieties generally better adapted and more compatible with ecological conditions. The 2008 National Biodiversity Action Plan (NBAP), updated in 2014, prioritizes agrobiodiversity and calls for greater policy harmonization to avoid adverse impacts to biodiversity. However, agrobiodiversity is not integrated into some of the largest and most influential agricultural programs in India, such as the National Food Security Act or the Mid-Day Meals Programme.

- The National Biodiversity Authority aims to coordinate efforts related to India's Biological Diversity Act (2002). The authority has sub-boards located in 29 states and has established nearly 38,000 Biodiversity Management Committees. National Biodiversity Authority has representation from agriculture agencies, forestry agencies, and environment agencies. However, this authority has not integrated biodiversity concerns into agricultural policies and initiatives. The potential for such approaches is being demonstrated, but more could be done.

- In the case of subsidies, outcome-based subsidies related to soil organic matter (e.g., a 1% increase), water table levels (e.g., a sustained 50-cm rise), or tree cover (e.g., a 5% increase) could drive the innovation that is urgently needed for sustainable outcomes. Critically, these interventions would likely simultaneously increase the effectiveness of the subsidies while also either reducing subsidy costs or increasing the value to the recipients for the same cost. Moreover, subsidies could be reconfigured slightly so that whereas a large portion is available for farm-level outcomes, additional outcome-based subsidies are available for outcomes at the village/landscape level, and possibly higher (e.g., sub-district). This structuring of incentives encourages farmers to coordinate in ways that strengthen communities and achieve the desired scale of outcomes, including enhanced community assets (e.g., biodiversity is typically better assessed at a landscape or sub-district level than at farm level).

- Minor shifts in funding criteria for large central programs could significantly alter state-level activities. For example, several benefits could be gained by aligning the National Food Security Act with the National Food Security Mission, the National Nutrition Mission, and biodiversity-related initiatives, particularly by including NFSM-advocated crops in the NFSA (e.g., pulses, which reduce the need for urea fertilization, fix nitrogen, and are generally high in protein and zinc). Likewise, numerous policies offer opportunities for very large benefits as a result of relatively easily achievable shifts such as these.

Specific approaches to policy modifications will need to be established through multi-level participatory processes, which will differ by location. The project will pursue policy-related opportunities at the national, state, and landscape levels to improve the effectiveness and efficiency of baseline activities. The aim is to provide (i) the evidence and road maps needed to make these shifts, (ii) context-specific suggestions for ensuring that the shifts are effective, generalizable, and politically viable, and (iii) technical advice based on lessons learned from other countries.

Output 1.2: *Capacities developed and institutional arrangements established for effective land use planning, and implementation guidelines at the landscape scale in Karnataka and Andhra Pradesh to promote SLM and biodiversity conservation in agriscapes (including off-farm protection of watersheds, biodiversity,*

HCVF, habitat connectivity, and ecosystem services).

The project will develop capacities and establish institutional arrangements (landscape-level governance structures) for effective land use planning at the landscape scale in Karnataka and Andhra Pradesh over a total land area of 1.5 million hectares. It will draw on existing data-sets that are complementary to LDN and biodiversity indicators but provide a stronger basis for informed decision-making between sectors. IUCN tools such as ROAM (Restoration Opportunities Assessment Methodology) will be applied to improve evidence-based planning. In addition, the project will bring to bear Rainforest Alliance's experience with facilitating larger-scale multi-stakeholder consultation to achieve integrated land management and restoration over the wider production landscape. Rainforest Alliance has successfully tested multi-stakeholder landscape governance in several countries and introduced the concept in India in a project financed by the GEF (Mainstreaming Sustainable Management of Tea Production Landscapes), which finished in 2018. The basis of the concept is to bring together the policy-making authorities, main economic actors, community leaders, and representatives of land users to agree on land use in their local area. This is a key mechanism to link successful demonstration of practices on farms to wider policy buy-in and supporting initiatives by communities (for example, agreeing on a tree planting initiative). Instead of trying to build SLM scale land unit by land unit, the project's approach will be to demonstrate success in important sectors and use governance structures to integrate them into larger-scale action plans that give definition to SLM policies.

Under this output, three land use plans will be developed, pending budget and feasibility assessment at PPG. SLM, sustainable agriculture, and ZBNF practices will be prioritized in the land use plans for scaling up according to site-specific and landscape-specific criteria, and based on existing assessment data, including LDN indicators and other relevant ecological and socio-economic indicators. Protection of watersheds, biodiversity, HCVF, habitat connectivity, and protection of ecosystem services will all be taken in to consideration.

In addition, implementation guidelines will be developed promoting SLM and biodiversity conservation through the above-mentioned land use plans, impact investments and multi-stakeholder collaboration mechanisms to support this transformation in Andhra Pradesh and Karnataka, in consultation with state and district level technical officers, and resource management institutions. A complete set of procedures and guidelines will be developed to support state governments in achieving economic growth without degrading land needed for growing crops and with the integration of land restoration practices.

Component 2. Scaling up of sustainable agriculture and landscape management for attaining LDN, biodiversity conservation and inclusive economic growth among rural producers in priority agriscapes of Karnataka and Andhra Pradesh

The outcome of this component is that sustainable agriculture and SLM approaches for attaining LDN, biodiversity conservation and inclusive economic growth are adopted by rural producers in priority agriscapes. The project's approach is to demonstrate that SLM practices will have a beneficial effect on farm economies. Leading from the agricultural commodities and engaging across the supply chain to harness the market drivers for sustainable social and environmental practices, the project will further impact upon food crops that all farmers grow alongside their cash crops. The project will focus on smallholders, promote SLM technologies to deliver climate change resilience, strengthen habitat connectivity for wildlife and ecosystem services, biodiversity conservation, and improved production and food security.

Output 2.1: *Farm-level scale up of agricultural practices that conserve biodiversity and reverse land degradation, particularly the Rainforest Alliance Sustainable Agriculture Standard (RA-SAS), and ZBNF, which is enjoying particular uptake in Andhra Pradesh.*

Practices required in the RA-SAS include: protecting native ecosystems and on-farm biodiversity; avoiding deforestation; maintaining healthy soils; sustaining water resources; and guiding farmers to select and adopt climate-smart planting materials and farming practices, which have been demonstrated to have beneficial impacts on their productivity. Additionally, the Standard seeks to reduce the greenhouse gas emissions from agriculture associated with the use of energy, fertilizers, pesticides, and methane emissions, while also maintaining or enhancing carbon stocks in soils, forests, and other on-farm vegetation. As such, the Standard promotes all three Climate Smart Agriculture (CSA) pillars^[19] at farm level. Moreover, the adoption of practices by the farmers is easily measured, either through auditing, if the farms decide to apply for certification, or through sampled monitoring, which will be incorporated into the project's M&E system. Successful agronomic technologies applied by the project partners with smallholders across tropical commodity production areas will be tested, with the purpose of verifying applicability to the selected states, acceptance by the farmers, and relevance to key factors contributing to land degradation. These will include practices piloted in the GEF tea project^[20], notably non-chemical weed management, which enables farmers to distinguish weeds that are harmful to production from those that are not and control them with minimal use of herbicide, while using the ground cover to protect soil. Through the multi-stakeholder channels established by the project (under Output 1.2), the recommended practices will be validated for inclusion in guidelines for achieving LDN through smallholder agriculture. ZBNF will initially target a total agriscap of 1,250,000 ha in Andhra Pradesh involving an estimated 1,500,000 farmers; whilst RA-SAS (latter focus on coffee and spices) will be rolled out in panchayats in Karnataka such that 250,000 ha of agriscap will be under improved practices (excluding protected areas) and 200,000 farmers will be transitioned to more climate resilient and ecologically conscious agricultural practices.

Four aspects are integral to the ZBNF concept: (1) *beejamrutham*, or microbial coating of seeds using cow dung and urine based formulations; (2) *jeevamrutham*, or the application of a concoction made with cow dung, cow urine, jaggery, pulse flour, water and soil to multiply soil microbes; (3) mulching, or applying a layer of organic material to the soil surface in order to prevent water evaporation, and to contribute to soil humus formation; and (4) *waaphasa*, or soil aeration through a favorable microclimate in the soil. For insect and pest management, ZBNF encourages the use of various *kashayams* (decoctions) made with cow dung and urine (from indigenous cows), lilac and green chillies. These practices have been shown in tests carried out in 2016-17 to increase soil fertility and water retention, with positive impacts on productivity: groundnut farmers had a 23% higher yield and paddy rice farmers 6%. Substituting chemical fertilizers and pesticides with natural inputs reduce input costs and farmers' exposure to credit risks (see baseline analysis); the increase in net income improves the cash flow of poor and vulnerable farmers and enhances their ability to deal with economic shocks. Moreover, field observations have noted that during extreme weather events such as the recent Cyclone Titli that affected the region on 11 October 2018, ZBNF farms with crops such as paddy incurred less crop losses from flooding and strong winds due the longer internodal length of roots in ZBNF crops, leading to better capacity in holding on to soils as compared with non-ZBNF crops. The practice of intercropping – growing multiple crops in proximity to each other – is encouraged under ZBNF as it ensures vulnerable communities' access to a suite of nutritional sources and income-generating crops throughout the year. Under ZBNF, farmers are encouraged to plant trees in the same plot of land. Agroforestry not only improves the productivity of the land, but also plays a pivotal role in landscape restoration and prevention of biodiversity loss. ZBNF will mainly focus on cashew, coffee, tamarind, jack fruit, turmeric, millets, groundnut, pulses and dry paddy crops. The total landscape area for ZBNF implementation is identified as 4.5 million hectares (excluding protected areas) that will be under improved management with 3 million farmers transitioned to more climate resilient and ecologically conscious agricultures practices through the engagement and participation of 6,500 panchayats in 5 years. Based on funding and capacities, however, the target under this proposal will be for ZBNF to be rolled out to 1,250,000 ha of agri-scapes will be under improved practices (excluding protected areas) and 1,500,000 million farmers will be transitioned to more climate resilient and ecologically conscious agricultural practices.

Output 2.2: *Smallholders, company technicians, government extension services, and local CSOs are capable to lead on the adoption and replication of RA-SAS and ZBNF.*

Based on an assessment of current farming practices, a training plan will be developed to scale up adoption of these sustainable farming practices. The emphasis will be on farmer-to-farmer knowledge dissemination through the FFS methodology, supplemented by knowledge of best practices tested in India and elsewhere, brought by technicians. In terms of ZBNF training, the emphasis will be on farmer-to-farmer knowledge dissemination; the trainers are the best practicing ZBNF farmers, called Community Resource Persons (CRPs). CRPs will form the key pillar of ZBNF Extension. The interaction of farmers and technicians will transition to digital services (see Output 2.4), which can build effectively on personal training but cannot replace it altogether.

Output 2.3: *Sustainable forest management, protection and restoration of watersheds, biodiversity conservation, HCVF, habitat connectivity, protection of ecosystem services, and landscape restoration agreed and implemented through PPP and impact investments (through 3.2).* Restoration of degraded land will take place both on farm- through soil management and planting of trees and selected crops suitable for growing on degraded land – and in the wider landscape, as communities mobilize through the landscape governance structures created to plant trees and protect HCVF. The project targets improved land use across 2 million ha, of which 1,350,000 ha through sustainable farm management and an additional 500,000 ha under participatory landscape governance. Restoration of 150,000 ha of land that is important for biodiversity (e.g. corridor) will take place on farms and in the wider landscapes through the techniques described, as well as the protection/avoided deforestation of an additional 150,000 ha of HCVF. Based on the agreed partnership and land-use plans of Component 1, site-specific and landscape-specific investments and programmes will be directed at meeting relevant environmental and socio-economic indicators and targets including through government and public-private programmes for the protection and restoration of watersheds, biodiversity, HCVF, habitat connectivity, and protection of ecosystem services in the targeted agriscapes. It is anticipated that much of the impact investments in sustainable/ZBNF agriculture through the partnership and activities under Output 3.2 will involve additional elements also investing in forests, biodiversity and ecosystem services outcomes on- and off-farm. The project will facilitate a proper process of feasibility reviews (technical, environmental and socio-economic outcomes) as well as the development of a portfolio of potential investment projects – hand in hand with the portfolio development under Output 3.2.

Output 2.4: *Best practices and innovations in agritech^[21] and digital information systems introduced and benefitting farmers, government and companies on upscaling and mainstreaming of sustainable agriculture.*

A different type of innovative technology to be applied in the project is digital information systems. Now achieving widespread uptake in India, as affordable mobile technology becomes available everywhere, innovative uses will be developed by the project, such as providing weather data to farmers or creating farmer to farmer exchanges on effective climate smart sustainable farming practices, access to markets and other key elements to enable upscaling.

Component 3. Market mechanisms and public-private finance for long-term adoption of SLM practices and increased investment in priority landscapes in the two project states

The outcome of this component is that market incentives for investing in sustainable commodities and value chains are strengthened and barriers to private finance are removed – contributing to sustainable farm management, SLM and LDN.

Output 3.1: *National and international markets are leveraged to create incentives for investing in sustainable agriculture production and value chains – contributing to sustainable farm management, SLM and LDN.*

For coffee, spices in Karnataka; as well as cashew, tamarind, jack fruit, turmeric, millets, groundnut, pulses and dry paddy crops supported under the ZBNF system in Andhra Pradesh. Rainforest Alliance^[22] will take the lead on mobilizing the private sector in support of SLM. In India, Rainforest Alliance has the capacity to engage market leaders in most of the major tropical commodity sectors and present the advantages of SLM production systems for their business operations. Increasingly companies are concerned about long-term supply, which may be threatened by climate change and smallholder poverty, leading young people to exit the business, instead of taking over the family farm. Being able to ensure that production will not be challenged by degrading farmland, provides an important contribution to long-term supply security for companies in both the domestic Indian market and internationally. Companies that make commitments to SLM make three major contributions to the achievement of SLM:

- They provide the market signals that mobilize the supply chain. If producers are required to demonstrate application of SLM practices (for example, by achieving Rainforest Alliance certification) in order to secure the market for their products, then they have a strong motivation to apply those practices. The project's M&E system – including through 'participatory informal monitoring conducted by farmers, will measure how SLM practices impact positively on farm performance and thereby make a strong business case for adoption by farmers. Nevertheless, market or policy signals play an important part of the initial motivation for a farmer to take the first steps, before results can be measured.
- They share their sector expertise. Once a company is committed to an SLM goal, then it has a business interest to ensure that its supply chain can comply. To support this interest, companies invest in technical and sometimes financial support to producers. This could cover a range of activities, such as quality testing, training in good agronomic practices and advance payments to cover cash flow cycles related to harvest times. The project will leverage such investments as co-financing for the project.
- They build sustainability into their business. Even with a favorable policy environment and smallholder capacity building, if there is limited market uptake, the risk is high that practices may not be sustained after the life of the project. For example, the largest spices company, McCormick^[23], made a public commitment in November 2017 to fully sustainable sourcing of all its ingredients by 2025, which include several spices from India^[23]. Such company commitments extend to the long term and offer a key mechanism for the internalization of SLM costs in the supply chain.

Under this output, Rainforest Alliance certification will be secured for coffee, spices and other crops produced in Karnataka under the RA-SAS (Output 2.1) to enable market recognition of responsible sourcing; similar certification may be secured for cashew, coffee, tamarind, jack fruit, turmeric, millets, groundnut, pulses and dry paddy crops produced under ZBNF in AP. In addition, the RA certification system generates revenue from a levy charged to the buyer of certified commodities. These revenues are partly reinvested in market development and training and technical assistance to sustain the farmers' commitment and capacity to apply SLM practices.

A financial levy on trade in Rainforest Alliance certified and ZBNF products will be refined and applied to sustain the market approach and generate investment in capacity building over the long term.

Output 3.2: *Portfolio of feasible impact investments developed with capital intermediaries and providers – combining investment in sustainable agricultural/ZBNF with SLM objectives in the priority landscapes.*

As highlighted under Barrier 3 above, the investment case for SLM adoption has not been adequately made and used as the basis for negotiating with investors. Under this output, a business case (including barrier analysis) will be developed in key agricultural commodities to demonstrate production and supply chain value of sustainable farming and SLM practices and generate data for private investors. A feasible investment portfolio (sustainable agriculture, ZBNF) will be developed for upscaling through blended and de-risking of corporate finance – specifically through the Rabobank-UN Environment Agri-3 Fund, the Sustainable India Finance Facility, and possibly the Land Degradation Neutrality Fund - Technical Assistance Facility. It is targeted to secure US\$ 44 million from private blended finance invested in ZBNF and sustainable agriculture to generate landscape-wide SLM through these private facilities. Another barrier to mobilizing such finance, from the demand side, is that debt-service can be a concern for government institutions inhibiting them from tapping in to such

impact financing. To this end, a detailed analysis will be undertaken of financial options for making investments in sustainable agriculture and ZBNF cost-neutral for the government. For example, ZBNF is expected to reduce the need for expensive agricultural inputs and this in turn will reduce farmer reliance on agricultural subsidies. The avoided subsidies^[24] for synthetic fertilizers could potentially free-up resources that can then be redirected to servicing loans from impact investors.

Output 3.3: *Farmers benefitting with better access to capital by training of producer organizations (FPOs), CSOs and local social enterprises on accessing blended finance in the priority landscapes.*

Small-scale farmers are presently not bankable. This restricts their capacity to invest in their farms and manage their seasonal cash flows. Through building the business case for sustainable practices, the project will reduce the risk for financial institutions to lend to farmers. At the same time, farmers accessing loans need to plan and manage the money that they borrow and meet their repayments. The project will select and support producer groups that have a sufficient level of maturity in their management systems and capacity to administer loans and train the group and the target farmers in financial literacy and business planning. It is planned to enable access of 5,000 farmers to credit facilities in this way.

Component 4. Knowledge management and national outreach on sustainable farming, SLM, ZBNF, LDN, and biodiversity conservation

The outcome of this component will be an evidence-based Monitoring, Evaluation & Learning (MEL) system that documents, analyses and disseminates effective intervention strategies for restoring productive landscapes and sustainable food systems to generate knowledge about successful approaches and enable uptake and replication at national and state levels.

Output 4.1: *MEL system implemented to track project progress and measure performance against targeted GEB and Core Indicators; as well as analyses of economics & scalability of ZBNF, and adoption of other best practices..*

A significant advantage of GEF over many other donor agencies is that projects may be implemented over a five-year time frame or more. This provides the opportunity for implementing a robust MEL system, with baseline, mid-term, and project-end measurement, to generate quantitative and qualitative data. The project will operate a three-tier approach to MEL. First, at farm level, MEL will focus success rate and impact with regards to environmental and farmer welfare through sustainable farming, including ZBNF, based on random sampling of a statistically significant number of farmers representing the different groups participating in the project. Partnership with a university or government agriculture research institution is a common way to undertake sampled monitoring, providing a group of enumerators who may gain valuable field experience that is pertinent to their studies. Secondly, at output level, it will measure delivery according to the MEL framework, to be developed in the PPG phase, and apply adaptive management to adjust outputs according to experience and changed external factors affecting the project. Finally, at Outcome level, it will measure impact as against the indicators and targets set in the project logframe. Additional methods of impact measurement may involve independent assessment and case studies of beneficial economic, social and environmental results from the changes in behavior with farmers and government lead agencies that the project facilitated, oriented to the global environment benefits of the GEF framework. The project MEL Plan will also involve a mid-term review, as well as an independent terminal evaluation. These will include evidence-based recommendations to confirm benefits of sustainable farming, including ZBNF, and inform policy change, investments, and replication in best practices related to restoring productive landscapes and sustainable food systems for LDN and BD conservation.

Output 4.2: *Communications campaign designed and implemented, including dissemination of best practices towards replication of agricultural practices that conserve biodiversity and reverse land degradation.*

The project will devise a tailor-made communications campaign to help with stakeholder adoption, replication and mainstreaming of ZBNF & sustainable agriculture practices, impact financing and landscape-based approaches towards improved SLM, LDN and biodiversity conservation, based on best practice. Documenting evidence, case studies, and lessons generates a stronger bottom-up case for policy reforms. Lessons and experiences will be documented, and disseminated through appropriate local, national, and international forums. The project will also aim to generate and communicate recommendations for policy change and institutional strengthening. The farm-level experience is expected to generate significant evidence and a vetted model of an alternative agricultural paradigm based in natural and ecologically conscious farming; this will be used as evidence-based reasoning for modifying agricultural policy and associated institutional strengthening. This would also facilitate scaling and replication in other geographies. The project will target different audiences for disseminating learning through a range of activities, including media placements, participation in selected national and international events, meetings with companies and engagement with policy makers. The project budget has been designed to allow for robust and far-reaching communication of and advocacy for proven sustainable farming and SLM practices. In addition, value chain partners in sustainable agricultural commodities in project landscapes will be supported with marketing campaigns to showcase their commitment to sustainable farming, LDN and biodiversity conservation.

4) Alignment with GEF focal area and/or Impact Program strategies

The project is aligned with BD Objective 1, *Mainstream biodiversity across sectors as well as landscapes and seascapes*. Specifically, under the biodiversity mainstreaming entry point, the project will support the GEF's requirement of "Improving and changing production practices to be more biodiversity-positive with a focus on sectors that have significant biodiversity impacts... through technical capacity building and implementation of financial mechanisms... that incentivize actors to change current practices that may be degrading biodiversity". The project will also contribute to "Developing policy and regulatory frameworks that remove perverse subsidies and provide incentives for biodiversity-positive land and resource use that remains productive but that does not degrade biodiversity." Specifically, under the Sustainable Use of Plant and Animal Genetic Resources entry point, the project will support the GEF's requirement of "in-situ conservation and sustainable use, through farmer management (focusing on Vavilov Centres of Diversity of plant genetic resources). This approach allows continuing evolution and adaptation of cultivated plants and domesticated animals and also meets the needs of rural communities, including indigenous peoples and local communities, especially women, who often depend on agricultural biodiversity for their livelihoods through its contribution to food security and nutrition, medicines, fodder, building materials and other provisioning services as well through support for ecosystem function. Women's participation will be particular critical, given the primary role that women play in agrobiodiversity management. In-situ conservation in production landscapes helps improve sustainability and resilience."

The project is closely aligned with the GEF 7 Land Degradation focal area goals of 1) aligning GEF support to promote UNCCD's Land Degradation Neutrality (LDN) concept through an appropriate mix of investments; as well as 2) harnessing private capital and expertise to finance investments in SLM, in particular in cooperation with the LDN fund and other innovative financing mechanisms. It is specifically aligned to LD Objective 2, Creating an enabling environment to support voluntary LDN target implementation; specifically through LD-1-1 'Maintain or improve flow of agro-ecosystem services to sustain food production and livelihoods through Sustainable Land Management (SLM)' as well as through LD-3-4 'Reduce pressures on natural resources from competing land uses and increase resilience in the wider landscape'. The project will meet the following GEF requirements: "Supporting smallholders through special lending and

through extension systems; Building capacity at all levels required to restore and maintain functional landscapes; Lessons learning and knowledge exchange and south-south cooperation within regions; Developing monitoring and information systems and targeted research on impacts, trade-offs, costs-benefit analysis of restoration, and identifying incremental synergies.”

5) Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing

Agriculture has been the mainstay of the Indian economy for centuries. Over half the country's population today depends on agriculture and allied services for their livelihoods. Agriculture constitutes 17 per cent of the gross value added (GVA) to the national economy. Agriculture in India has transitioned from subsistence to commercial farming in order to reduce the country's import-dependence on food grains. It has also evolved to meet the diverse nutritional requirements of a rapidly growing populace. However, due to systemic inefficiencies and high resource-dependencies, the dominant form of agriculture today imposes significant negative externalities and presents critical challenges for a range of stakeholders – from farmers to consumers, as well as natural ecosystems and biodiversity.

The project will demonstrate an alternative low-input, climate-resilient type of farming that encourages farmers to use low-cost, locally-sourced inputs, gradually reducing the use of chemical fertilizers, and industrial pesticides. The benefits to farmers include; a) provision of cost-effective natural fertilizers, b) consistent yields, c) restoration of ecosystem services, d) conservation of biodiversity, e) use of local seeds, f) multi-cropping with tree cover, g) ability of farms to become more resilient to extreme climate events, h) safe and nutritious food, i) improvements in farmer health, and j) empowerment of women farmers. The practices will conserve globally significant biodiversity, reduce land degradation, increase resilience to climate change, and reduce CO₂ emissions from the agriculture sector.

To achieve this transformation requires a concerted work programme to advocate for policy changes, motivate the private sector to change buying behavior, prepare the case that will enable financial service providers to come to the table and to support farmers to make the transition to the improved techniques. The GEF incremental investment enables that work programme to take place. Without it, some smaller initiatives will occur but they will not be connected and will not achieve a critical mass of incentives and capacity to transform land use practices at scale.

6) Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF)

The project will scale-out sustainable agriculture and ZBNF in 12,924 *panchayats*, reaching out to at least 750,000 farmers, and involving 3 million hectares of land. Global environmental benefits are expected to be realized as follows:

- Land degradation: SLM practices are being followed over 1.5 million ha through adoption of ZBNF and sustainable agriculture in 1,450,000 ha agriculture farmland, leading to restoration of degraded soil and improved fertility of drought-prone land; as well as 20,000 ha SFM/reforestation of key biodiversity habitat (e.g. wildlife corridor in Karnataka) and 30,000 ha avoided deforestation/protection of HCVF for key biodiversity habitat and ecosystem services – specifically in the Western Ghats in Karnataka and Eastern Ghats in Andhra Pradesh which are true biodiversity hotspots nationally as well as internationally.
- Sustainable agriculture and ZBNF will result in significant reduction in the use and pollution due to agro-chemicals, including in downstream water bodies. It will also result in significant

- Sustainable agriculture/ZBNF through its targeted reduction and/or elimination in the use and corresponding production of fertilisers and other chemical inputs, have the potential to avoid CO2 emissions at various stages of the agricultural value chain. Educating farmers about the impacts of soil degradation, soil nitrogen contamination, and crop burning on climate change, helps contribute to climate change mitigation while building their capacity to tackle such issues. In terms of carbon sequestration, compared to conventional agriculture, ecological farming practices offer greater potential for sequestering carbon in soils. Improved soil organic content through mulching, ZBNF and other practices, and improved soil health will have additional significant CCM benefits, as well as strengthen farm resilience to extreme drought such as e.g. found in tea farms in Sri Lanka, India, China and Vietnam in the GEF-funded Sustainable Tea Landscapes project.

- Biodiversity conservation: The project areas in Karnataka fall within the Western Ghats, one of the Biodiversity Hotspots in the world. It has a rich diversity of flora and fauna, including megafauna such as elephants and tigers. Other important fauna found here include leopards, wild dog (dholes), Indian bison (gaur), and a rich variety of birds. The project areas in Andhra Pradesh lie in the Eastern Ghats and are also rich with endemic and vulnerable species, including fauna such as elephants, tigers, leopards, sloth bear, wild dog (dhole), Indian bison (gaur), as well as migratory birds like flamingos. It is also believed to have extant population of the Great Indian Bustard, listed in Schedule I of the Indian Wildlife (Protection) Act, 1972, in the CMS Convention and in Appendix I of CITES, as Critically Endangered on the IUCN Red List and the National Wildlife Action Plan (2002-2016). It has also been identified as one of the species for the recovery programme under the Integrated Development of Wildlife Habitats of the Ministry of Environment and Forests, Government of India. AP is the place of origin of two indigenous cow breeds, the Ongole and Krishna Valley breeds. Several national parks and wildlife sanctuaries fall within the priority agriscapes in both the project states. Through the use of native species and breeds on farms, enhanced soil biodiversity, reduced adverse impacts of agriculture on surrounding natural areas over the 1.5 million ha, land use planning and landscape restoration efforts, the project will have a spillover positive net impact on the biodiversity in the project landscapes.

7) Innovation, sustainability and potential for scaling up.

Innovation:

The project will be highly innovative in its integrated focus on sustainable farm practices, integrated landscape/ agriscap management, blended finance and domestic and international supply chains. It will be the first transformative project in the country that will aim towards achievement of the country's LDN targets under UNCCD. It is expected that the lessons from the project landscapes will feed into sub-national and national processes for replication and upscaling. The agriscapes approach is a novel concept and has been piloted by IUCN previously in one landscape in India (in the Munger district of Bihar). Its adoption in the project can serve as a proven replicable model for the rest of the country. The project will develop a range of appropriate technologies and services to facilitate the uptake by large numbers of smallholder farmers of SLM practices. It will integrate policy, technical and market-based approaches to create a critical mass of capacity and incentives for SLM adoption at scale.

Various aspects of the ZBNF concept are innovative. The blend of cutting-edge technology with traditional knowledge draws on the best of both systems and reduces the cost of cultivation as most of the practices involve low/ no expenditure and improve net incomes without yield reduction. This makes adoption attractive to smallholder farmers. The ZBNF concept focuses the agricultural system on knowledge rather than the product. It invests heavily in building the capacities of farmers and their continuous access to information. The crucial innovation and the strength of the program is the farmer-to-farmer knowledge dissemination strategy. The trainers are the best practicing farmers, called Community Resource Persons (CRPs), who are highly motivated and strongly committed to ZBNF as their own lives have been transformed by it.

The standard and certification system that Rainforest Alliance will bring to the project is also highly innovative in the voluntary standards movement as it is being combined with the UTZ standard, following the merger between the two organizations in 2018. Both systems have considerable take-up in India and their integration will offer a stronger system across the major markets of Europe, North America and Japan. A major target will be to grow what is presently a small market presence in India. The new combined standard will be launched at the beginning of 2020. In spices, the system will further collaborate with the Union for Ethical BiTrade, a voluntary standard for wild harvested products, which is active in the herbs and spices sector. The practices promoted by the new Sustainable Agriculture Standard will be closely aligned with those of ZBNF. An innovation of the project is to offer different, compatible frameworks for sustainable farming, so farmers select the practices that best respond to their needs.

The project will also leverage innovative private sector financing to enable transition to an economic model in which improved environmental management delivers returns that can meet needs of investors.

Sustainability:

A fundamental aspect of the project design is that it will positively affect institutions at state, district, and local levels. Direct capacity building will take place through training programs launched during project implementation and carried forward post-project by strengthened institutions. The project will invest in providing institutions with the tools required to continue activities of the project where necessary. In AP, the non-profit company established by the government, RySS is well positioned and resourced to take the project's achievements forwards

The market-based approach of the project is a key sustainability strategy. Companies will invest in sustainable farming when it is embedded in their business operations through a commitment to responsible sourcing. This is amply demonstrated in the coffee and spices sectors already, with companies building their own teams of trainers and technicians. Forward-looking companies are now investing in landscape-scale SLM, recognizing that their long-term supply security is affected by the ecological health of the ecosystem outside the farm and the threat of deforestation that threatens ecosystem services and leads directly to climate change. The project will harness these market forces, building on the long-standing presence of Rainforest Alliance in the market and established relationships with many of the leading companies in these sectors.

The third aspect of the project's sustainability strategy is building the business case for investment in sustainable farming and SLM and stimulating investment through blended finance models that enable smallholders to become bankable. Sustainability becomes mainstream when it attracts normal business investment, which in turn requires smallholders to belong to viable organizations with business plans. This is the project's vision: to achieve financial sustainability as farmers reduce use of inputs, apply productivity-enhancing management practices and get out of the perpetual cycle of debt enforced by conventional farming practices.

Scaling up:

The project is designed to reflect national, state, district and local priorities, making the project highly relevant for numerous stakeholders, including small and marginal groups. The project will also maximize the utilization of existing institutional frameworks. Both of these approaches will facilitate replication and up-scaling. All of the project's components are designed to generate replicable models. In particular, the capacity building and the development of guidelines for each aspect of the project will strongly support up-scaling. Having a separate component on knowledge management and national outreach for scale up as per the project design will enable the successful uptake and upscaling of the project even after closure.

- [1] The Energy and Resources Institute (2018). Economics of Desertification, Land Degradation and Drought in India. Vol I: Macroeconomic assessment of the costs of land degradation in India. New Delhi, India: TERI. 149 pp.
- [2] The land degradation process classes mapped by SAC include the following: 1) Vegetation Degradation 2) Water erosion (Sheet erosion, Rills, Gullies, Ravines), 3) Wind erosion (Stabilized, Partially stabilized, Un-stabilized dunes), 4) Waterlogging (Surface ponding, subsurface waterlogged), 5) Salinization / alkalization (Saline soils, Sodic soils, Saline-sodic soils, Rann), 6) Glacial (Frost heaving, Frost shattering), 7) Anthropogenic (Mining, Brick kiln areas, Industrial effluent affected areas) and 8) Others: Mass movement / mass wastage, Barren rocky/stony waste. In the SAC study, the classification system and the broad methodology for the desertification/land degradation mapping has been standardized during the previous studies, ISRO has been followed. It comprises three elements: Land Use, Process of Degradation and Severity Level. SAC provides an additional data on the severity of degradation process which has not been provided in any of the earlier reports by other organizations. The SAC data is useful for management purposes as the decision makers can prioritise the land reclamation process. The SAC Atlas 2016 is therefore being used as a reference and methodology in the proposal.
- [3] "MOSPI Gross State Domestic Product". Ministry of Statistics and Programme Implementation. 3 August 2018
- [4] Environmental Management & Policy Research Institute (2012). State of Environment Report Karnataka 2011.
- [5] Ibid
- [6] The Eastern Ghats are a discontinuous range of mountains along India's eastern coast. The Eastern Ghats run from northern Odisha through Andhra Pradesh to Tamil Nadu in the south. They are eroded and cut through by four major rivers of peninsula India viz. Godavari, Mahanadi, Krishna and Kaveri.
- [7] *Income, Expenditure and Productive Assets of Farmer Households*. 2005. Ministry of Statistics and Programme Implementation, Government of India
- [8] 2005 Situation Assessment Survey of Farmers Indebtedness of Farmer Household in India.
http://planningcommission.gov.in/sectors/agri_html/Indebtness%20of%20farmer%20household%2059%20round%202003.pdf
- [9] For example, diclofenac given to cattle in India caused the deaths of over 90% of several species of endangered vultures in the late 1990s and early 2000s (Asian white-backed vulture, Indian vulture, and slender-billed vulture).
- [10] https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/soils/health/biology/?cid=nrcs142p2_053868
- [11] <http://globalagribusinessalliance.com>
- [12] Central government provides support to natural farming through schemes such as Rashtriya Krishi Vikas Yojana (RKVY) and Paramparagat Krishi Vikas Yojana (PKVY).
- [13] The following data are from 2015-16. The baseline will be updated during the PPG phase, and will be made more specific to relevant state actions at priority locations over the course of the proposed project.
- [14] Database on Coffee, Market Research & Intelligence Unit, Coffee Board of India, 2014.
- [15] Rainforest Alliance certification database (extrapolated from national scale data)
- [16] An Agriscape or agricultural landscape is defined as a "unit of a landscape in which the interplay of ecological, economic and social inputs that influence agricultural outputs can be delineated, mapped and measured".
- [17] <http://www.bonnchallenge.org/content/india>
- [18] The Land Degradation Neutrality Fund was launched in September 2017 at the UNCCD Conference of Parties to channel public and private money for sustainable land management and landscape restoration activities. The Fund is managed by Mirova and has a Technical Assistance Facility, managed by the Sustainable Trade Initiative (IDH).

[19] The CSA concept incorporates three main pillars: 1) sustainably increasing agricultural productivity and incomes; 2) adapting and building resilience to climate change; 3) reducing and/or removing greenhouse gases emissions, where possible.

[20] Mainstreaming Sustainable Management of Tea Production Landscapes: GEF project that ended in 2018.

[21] Agri-tech is the use of technology for farming that is developed to improve efficiency and profitability. It aims to improve farming through information monitoring and analysis of weather, pests, soil and air temperature.

[22] Rainforest Alliance is uniquely placed among international organizations to deliver the market incentive for SLM uptake and achievement of LDN targets. For thirty years, it has operated across the value chain of different tropical commodities, mobilizing company commitments for participation. This achievement has been built primarily but not exclusively through the standard and certification system. As of March 2018, 3,639,290 ha of tropical farmland are certified as applying SLM practices according to the Rainforest Alliance Sustainable Agriculture Standard. This farmland comprises 1,375,497 farm operations, with an average holding of 2.65 ha, clear evidence that the system is dominated by smallholders (Rainforest Alliance internal data). Some companies with which Rainforest Alliance is collaborating, however, have not made commitments to certification, but rather follow a different approach with many similarities. For example, in 2010, Nescafé, the world's largest coffee brand, co-developed with Rainforest Alliance the *Nescafé Better Farming Practices*, which are closely modelled on the Sustainable Agriculture Standard. Rainforest Alliance provides a training and technical assistance program to support uptake and also collaborates on an M&E system to measure positive social and environmental change. The practices are applied in Nescafé's supply chain in India, among many other countries.

[23] <https://www.environmentalleader.com/2017/10/174542/>

[24] The total fertilizer subsidy in 2014-2015 was estimated at INR 679.7 billion

1b. Project Map and Coordinates ⓘ

Please provide geo-referenced information and map where the project interventions will take place.

Please see map in Annex A

2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Indigenous Peoples and Local Communities No

Civil Society Organizations Yes

Private Sector Entities Yes

If none of the above, please explain why:

In addition, provide indicative information on how stakeholders, including civil society and indigenous peoples, will be engaged in the project preparation, and their respective roles and means of engagement.

The project will promote participation of a wide range of relevant stakeholders including government agencies, civil society (e.g., NGOs, self-help groups, and producer groups), the private sector, relevant financial institutions (e.g., National Bank for Agricultural and Rural Development, Sustainable India Finance Facility), women, indigenous communities, and identified vulnerable groups (e.g., scheduled castes). During the PPG phase, a broad stakeholder mapping and engagement strategy will be undertaken. In India, stakeholders from CSOs, private sector, state and district government will be engaged through project design workshops in each region to update and complete relevant contextual information and to validate assumptions, risks and goals for project implementation. Additionally, the PPG will undertake at least one event in each region to solicit input from community stakeholders in project design, including representatives of indigenous groups, if applicable. The local scale consultations during the PPG will ensure equitable participation of women and youth. The consultation events will identify the relevant baseline activities in the regions and potential partners for project implementation.

A gender analysis will be undertaken during the PPG phase and will form the basis for appropriate plans, activities, monitoring, and safeguards to be defined in the project document. Key elements will be incorporated in the results framework. Participatory processes will include: (i) regular meeting of the project steering and advisory committees, (ii) multi-stakeholder consultation workshops at national and state levels, and (iii) direct consultations with stakeholders via individual and focus-group meetings. Government stakeholders will include Ministry of Environment, Forest, and Climate Change (MoEFCC), Ministry of Agriculture & Farmers' Welfare, as well as the state governments of Karnataka and AP. Research Institutes such as Forest Survey of India (FSI), Indian Council of Forestry Research and Education (ICFRE), Forest Research Institute (FRI) and ICAR - Central Research Institute for Dryland Agriculture may also be involved.

The project has been designed in close consultation with MoEFCC, while consultations have also been held with relevant divisions within the Ministry of Agriculture & Farmers' Welfare as well as the Ministry of Rural Development, and their feedback has been duly noted and used to further strengthen the concept. The state governments of Karnataka and Andhra Pradesh have also been consulted during the concept development and RySS which is a not-for-profit company fully-owned by Government of Andhra Pradesh has been involved closely in the project design. Consultations have also been held with the

Rabobank (e.g. their Agri-3 Fund program with UN Environment) and the UN Environment facilitated Sustainable India Finance Facility (SIFF). The Coffee Board of India and Spices Board of India, as well as sustainable sourcing programs of companies such as Nescafe and Mc Cormick are existing close allies and a preliminary discussion has been held with both, with an invitation to come back when the process is further developed.

At the international level, the project partners will engage selected companies, industry associations and CSOs working within target agricultural sectors. The PPG phase will include consultation with the key stakeholders, including leading individual companies, with which Rainforest Alliance has established close relationships through their commitment to certification. These consultations will include generating support for the co-financing target of the project from the private sector. (See **Annex E** for further information on main stakeholders.)

Annex E

Key Stakeholder

Stakeholder	Category	Role in project design
Ministry of Agriculture and Farmers' Welfare	National Government	The Ministry of Agriculture and Farmers' Welfare (formerly the Ministry of Agriculture) formulates and administers the rules, regulations and laws related to agriculture at the Federal level in India. The Ministry comprises three departments (i) Department of Agriculture, Cooperation and Farmers' Welfare (DACFW), which is responsible for agricultural policy-making and programs; (ii) Department of Agriculture Research and Education (DARE), which oversees the Indian Council of Agricultural Research (ICAR) and (iii) Department of Animal Husbandry, Dairying and Fisheries (DAHDF). The Ministry will be part of the Project Steering Committee and assist in the scaling of the ZBNF program to other states in India.
Ministry of Environment, Forest and Climate Change (MoEFCC)	National Government	MoEFCC is responsible for the administration of the national parks of India and for planning promoting, coordinating, and overseeing the implementation of environmental and forestry programs and policies. MoEFCC also administers and supervises the Indian Forest Services (IFS). MoEFCC will play a key role in the project as a member of the Project Steering Committee and, as host of India's GEF Operational Focal Point, will facilitate coordination with GEF Secretariat and with other projects in India's GEF portfolio.
Ministry of Rural Development (MoRD)	National Government	The MoRD manages development of rural India. MoRD has two departments: Department of Rural Development and Department of Land Resources. The Ministry will be consulted during project preparation in how the ZBNF program can best be integrated into the national rural development plans.
Karnataka State Government	State and Local Government	Indian state governments have extensive regulatory powers and numerous departments and agencies mandated to develop policies at state level. The relevant bodies will be key participants in the design workshops to provide the essential baselin

		e information regarding land use policies and to identify the policy channels and initiatives through which Component 1 can be implemented
Rythu Sadhikara Samstha (RySS)	State and Local Government	RySS is a not-for-profit company, fully-owned by Government of Andhra Pradesh which has pioneered Zero Budget Natural Farming in the state of AP. The aim is to reach universalization of Natural Farming practices by reaching 6 million farmers and converting 8 million hectares into natural farming fields. RySS will be the executing agency of the project and lead the project preparation phase.
Andhra Pradesh State Biodiversity Board	State and Local Government	The Andhra Pradesh State Biodiversity Board is statutory and autonomous body corporate has been constituted by the Government of Andhra Pradesh in the year 2006. Its functions include (i) Advise the State Government subject to any guidelines by the Central Government on matters relating to conservation of biodiversity sustainable use of its components and equitable sharing of the benefits arising out of the utilization of biological resources; (ii) Regulate by granting of approvals or otherwise, requests for commercial utilization or bio-survey and bio-utilization of any biological resources by Indians; (iii) Perform such other functions as may be necessary to carry out the provisions of the Biological Diversity Act 2002 or as may be prescribed by the State Government. The Board will be part of the Project Steering Committee and closely involved in the preparation of the project. Their specific knowledge of the biodiversity of the state will assist in the mainstreaming of biodiversity in to the ZBNF approach.
The Andhra Pradesh Forest Department	State and Local Government	The Andhra Pradesh Forest Department deals with protection, conservation and management of forests. The Forest Department will be consulted during project preparation regarding the use of trees in agricultural land and the most appropriate species to use.
The Andhra Pradesh Agriculture Department	State and Local Government	The Department of Agriculture provides agricultural extension services to farmers in the State and introduces the latest technical knowledge. It also carries out certain facilitating functions including soil testing and monitoring and evaluation of agricultural practices. The department currently has approximately 2,000 Agricultural Officers and a further 4,500 Agricultural Extension Officers, mostly stationed in the districts of AP. The department will be a member of the Project Steering Committee and actively involved in the project preparation phase. The Department's experience in extension services as well as in the monitoring and evaluation will be extremely relevant as the components of the project are developed in more detail.
Ministry of Industry, Commerce and Tourism - Coffee Board	Government body	Regulatory body for the Indian coffee sector, which developed a plan in 2017 for a sustainable coffee sector. Important policy stakeholder from which to secure support for project operations in Karnataka. Rainforest Alliance has maintained contact

fee Board of India		with the Board since making a personal visit to discuss cooperation in May 2017. The Coffee Board launched in September 2018 a new digital app, <i>Coffee Krishi Taranga</i> , to deliver information to farmers, including, for example, weather warnings and pest and disease incidence. Rainforest Alliance has shared with the Coffee Board information about its own work in digital information systems for farmers. It is hoped to define cooperation in the project.
Ministry of Industry, Commerce and Tourism - Spices Board of India	Government body	Regulatory body for the Indian spices sector; organizes annual trade fair and participates in Sustainable Spices Initiative facilitated by IDH. Important policy stakeholder from which to secure support for project operations in Karnataka. As the leading certification body in the Indian spices sector, Rainforest Alliance has a close relationship with the Spices Board, participating annually in the spices trade fair, which the Board organizes.
Centre for Responsible Business (CRB)	CSO	An important CSO in promoting sustainability concepts to the private sector. Holds an annual conference, which highlights key social and environmental issues related to commodity production. Rainforest Alliance participates annually
Indian Institute of Plantation Management (IIPM)	CSO	A key organization in sustainable commodities; works in close partnership with the Indian Coffee Board's research division and has technical capacity in extension. Expected to be a partner in project implementation
Union for Ethical Biotrade (UEBT)	Civil society organization	Established in 1996 by the United Nations Organization to follow up the Rio conference with a vehicle to engage the private sector in aligning their business operations with biodiversity conservation. It developed a standard and certification system. It has a partnership with UTZ to undertake certification of spices. The partnership will continue but is being adjusted in 2018 to allow for the fact that Rainforest Alliance also certifies spices
Tata Global Beverages	Company	Tata is the largest tea and coffee company in India, with deep knowledge of production of both crops and related land degradation issues. It has an active sustainability program and is expected to become an important partner in Component 3 of the project
Hindustan Lever	Company	The Indian operation of Unilever has major brands of coffee in the Indian market. It has a global commitment to responsible sourcing and is expected to become a partner in Component 3 of the project
ATV McCormick	Company	The Indian operation of McCormick, the world's largest spices company, which has a global commitment to sustainable sourcing and is expected to become an important partner in Component 3 of the project

The Digital Green Foundation	Private Sector	Digital Green was founded on the belief that technology can accelerate efforts to end poverty. Since then, their technology-enabled approach has reached over 1.8 million of the world's people. In India, Digital Green pioneered, tested and successfully scaled their video-enabled approach to agricultural extension. The Digital Green Foundation will be consulted during project preparation on best approaches to use technology to scale ZBNF
BNP Paribas	Private Sector	The UN estimates that between \$5,000 and \$7,000 billion will have to be mobilized to achieve the SDGs. \$2,500 billion will be needed only for developing countries. BNP Paribas wants to actively support the achievement of SDGs by offering its customers a viable economic model to develop and sustainably extend financing sources over the long term. As a key player in finance, BNP Paribas has the capacity to reach global investors and has acquired expertise in multilateral conversation management. BNP Paribas has already mobilized EUR 155 billion in financing for energy transition and sectors considered to contribute directly to SDGs. BNP Paribas part of SIFF, so role similar to SIFF.
United Planters Association of South India (UPASI)	Industry Association	Represents all agricultural sectors active in south Indian, including coffee, tea, rubber, spices and others. Has a research division that will be an important source of information for baseline analysis and identification of most important economic sectors and their relationship to land degradation
Confederation of Indian Industry (CII)	Industry Association	Represents major Indian companies across diverse sectors. Has an agricultural sustainability program and leads the Indian Business & Biodiversity Initiative, which is supported by GIZ. hosts numerous conferences; Rainforest Alliance is invited as an Associate. An important channel to the Indian private sector and expected to become an ally and facilitator in implementing Component 3 of the project
Global Coffee Platform (GCP)	Multi-stakeholder initiative	Initially founded as the Common Code for Coffee Communities (4C), GCP brings together private sector, producers and civil society to develop common approaches to key social and environmental issues and to harness public and private investment to address them. Rainforest Alliance has been a Council member of GCP since its founding in 2016 (and earlier a Council member of 4C)
Sustainable India Finance Facility (SIFF)	Public-Private Partnerships	The SIFF is an innovative partnership facilitated by the United Nations Environment Programme, World Agroforestry Centre and BNP Paribas. It brings long-term finance to projects and companies that stimulate green growth, increase resilience, reduce greenhouse gas emissions and improve rural livelihoods. The SIFF will be a member of the Project Steering Committee and closely involved in the preparation of the project, especially on the development of Component 2 and the creation of ince

		ntives for farmers to make the transition to sustainable farming.
Sustainable Trade Initiative (IDH)	Technical agency	Started by the Dutch government to promote social and environmental best practices in tropical commodity production, IDH now channels funding additionally from other governments. It maintains an office and has an active presence in India, especially in the coffee, tea and spices sectors.
Local Communities/Farmers	Communities	Local communities/Farmers in Karnataka and AP will be the primary stakeholders of the project. Communities/farmers will play a central role in the project's design, implementation, and evaluation.

3. Gender Equality and Women's Empowerment

Briefly include below any gender dimensions relevant to the project, and any plans to address gender in project design (e.g. gender analysis).

The project's approach to gender recognizes the importance of involving women in all aspects of commodity production and sale. Equitable allocation of resources, involvement and decision-making will result in greater incomes and overall well-being for all members of the household – women, men, girls and boys – and improved natural resource management. To this end, the project will incorporate the following activities:

i) Context assessment and gender mainstreaming: Because gender relations, aspirations, and opportunities can vary greatly, the project will begin with a closer look at the social constructs that define the roles, burdens, access to and control of resources for men and women in the project regions. In addition to gender, the assessment will look at household economy and livelihood contexts more broadly, including differences between socio-economic groups and ethnicities. The results of the context assessment will inform selection of focal economic sectors and guide dialogue regarding behavioral changes within producer organizations and communities.

ii) Gender-balanced management in organizations: Behavior change and gender-balanced management at the level of CSOs, producer organizations and land governance structures are key to opening spaces that empower women. In the case of producer organizations, women and men will be trained and assisted for those activities that they have a role or interest in. Women will be adequately represented as group administrators and trainers. Trainers will be taught in how to be aware of, responsive to and advocate for gender issues in their training context and community and equipped to counter negative gender stereotypes.

iii) Technical and financial capacity building: Targeted, gender-balanced capacity building and technical assistance packages will be refined based on the results of the context assessment. The timing and structure of workshops will take care not to overburden participants, particularly women, who tend to shoulder more of the household and caregiving responsibilities. In addition to the core training activities, specialized technical assistance may be provided in support of other crops or activities, especially those that are of primary importance to women's livelihoods. Technical assistance will also include financial management skills, which can greatly improve return on a families' monetary and personal investments and, in some cases, help families access credit. Experience has shown that women, who normally have lead responsibility for balancing family budgets, show significant interest in such tools that help build their entrepreneurial skills.

iv) Gender-disaggregated performance indicators: Monitoring and evaluation will include gender-specific indicators (e.g. management positions held by women in rural organizations; access to credit for women) and indicators of the presumed result of greater gender equity (e.g. increased family income, improved household wellbeing, more efficient businesses, and improved natural resource management). Results will be disaggregated so as to demonstrate distribution of results across the different genders, socio-economic and ethnical groups.

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment? Yes

closing gender gaps in access to and control over natural resources;

improving women's participation and decision-making; and/or

generating socio-economic benefits or services for women.

Will the project's results framework or logical framework include gender-sensitive indicators?

TBD

4. Private sector engagement

Will there be private sector engagement in the project?

Yes

Please briefly explain the rationale behind your answer.

Karnataka State, one of the two biggest national producers (with Tamil Nadu) and together produce 75% of India's coffee. Smallholders sell mainly to brokers, which supply leading roasters: Hindustan Lever, Tata, Nestlé, Café Coffee Day, etc. Rainforest Alliance certification is well accepted in the Indian market. The project will collaborate with industry leaders in the coffee sector, where it is estimated that the private sector invests around \$250 million annually at a global level in efforts to make production more sustainable (Coffee Barometer 2018), with a further \$75 million invested by donor agencies. In the Indian spices sector, leading companies are participating in GIZ's Private Sector Action for Biodiversity and preparing training materials. IDH's Sustainable Spice Initiative offers a forum for companies and civil society to discuss social and environmental problems in the sector and appropriate responses on which they can collaborate. The global leader in spices, McCormick, which has a joint venture in India with AV Thomas, has a major public commitment to responsible sourcing, including certification, and will be a partner with Rainforest Alliance in the project. This has triggered Indian companies training smallholders in sustainable production. All these private sector initiatives in the spices sector provide a mechanism for the project partners to build synergy, attract private (impact) finance and conduct information exchange.

The project has secured an 'in principle' agreement with the Sustainable India Finance Facility – a partnership between UN Environment, BNP Paribas and the World Agroforestry center to access a significant investment fund/co-financing in sustainable agriculture and SLM investments in the two targeted States and landscapes. Additionally, the project expects to collaborate and secure additional investments towards sustainable agriculture, landscape restoration and biodiversity conservation through the Agri-3 Fund which is based on a global MoU between the Rabobank and UN Environment.

5. Risks

Indicate risks, including climate change, potential social and environmental risks that might prevent the Project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the Project design (table format acceptable)

Risks	Level	Mitigation measures
Environmental risks: Climate change affects adversely productivity of farmland as dry seasons become longer and rainfall less frequent	Moderate	The RA-SAS and ZBNF farming practices promoted by the project incorporate measures to build climate change resilience, through improved soil quality and water retention, natural techniques for managing pests and diseases and maintaining cover crops and shade canopies. The systems incorporate assessment of climate change risk and design and application of practices to mitigate and adapt to climate change, to build farmer understanding and encourage proactive response, including conserving trees, planting native trees and not encroaching on forested land. The agroforestry concepts inherent in these approaches enable farmers to become more productive and diversified economically, leading to more resilient livelihoods.
Political risks: Changes in political circumstances and government priorities	Low	The project is well aligned with Indian government priorities. All the partners have built important government relations, and Rainforest Alliance has been recognized as an innovator in its work in non-chemical weed management and smallholder inclusion. Broad stakeholder engagement throughout the project preparation and the continuation of this engagement during the implementation will establish and strengthen relationships across a wider key group of government agencies to ensure continued policy level support for the project.
Social risks: Inequities in social structures, including gender discrimination, may reduce the participation of all social groups, undermining the inclusiveness of the project activities	Moderate	Socio-economic analysis undertaken during the PPG phase will identify exclusion issues and inform project design of inclusion activities at local community and producer organization levels. The project will specifically target smallholder groups, which are often marginalized in sustainability initiatives, because they are hard to reach and may not be reliable participants in training activities, because they are busy pursuing their diversified livelihood strategies.
Economic risks: Commodity producers may resist adopting SLM best practices and hence reduce the impact of the project activities	Low	Smallholders will respond positively to training and technical assistance that addresses problems affecting their economic wellbeing. For example, integrated pest management teaches a farmer to make informed decisions that reduce dependence on costly and sometimes inappropriate agrochemicals. The project will mobilize policy and market incentives but,

		even more influential for the farmer will be seeing the value of the practices on farm performance
Finance risks:	High	Sustainable uptake of new SLM technologies is greatly enhanced by facilitating access to finance by farmers. While plantation owning companies normally access bank finance straightforwardly, smallholders find it very difficult, because they do not have collateral and their risk profile is too high. The project partners are engaged with the financial services sector and will aim to leverage existing funds to direct new investment in the project's objectives. Through partnering with the Sustainable India Finance Facility, as well as the Rabobank Agri-3 Fund on blended finance for de-risking loan and grants for sustainable land practices, this risk will be significantly reduced and farmers' and enterprises' access secured.
Market risks: Markets may not provide incentives for sustainable production if quality or service are not sufficiently attractive	Moderate	The project will benefit from Rainforest Alliance's long-standing engagement in key agricultural sectors and good standing with major companies in India and internationally. The project will have exceptional access to and involvement of major companies and industry bodies. The success of Rainforest Alliance's certification system will ensure active participation by those companies that have made commitments to it.

6. Coordination

Outline the institutional structure of the project including monitoring and evaluation coordination at the project level. Describe possible coordination with other relevant GEF-financed projects and other initiatives.

UN Environment will be the lead GEF Implementing Agency for this project, in collaboration with IUCN India as GEF Co-Implementing Agency. The project will be executed at the national level by the Ministry of Environment, Forest and Climate Change, in collaboration with the Ministry of Agriculture and Farmers' Welfare, State governments in Andhra Pradesh and Karnataka, as well as other national and state institutions. Other key technical partners include the Department of Land Resources, Ministry of Rural Development, the Ministry of Industry, Commerce and Tourism (Commodity Boards); Rainforest Alliance, IUCN members, Rythu Sadhikara Samstha (RySS) in Andhra Pradesh; Ethical Tea Partnership (ETP); Indian Institute of Plantation Management (IIPM), United Planters Association of South India (UPASI), GUNA - sustainable commodities India Consumer Goods Forum (to be confirmed), Tropical Forest Alliance, International Coffee Organization (India member since 2007), IDH Sustainable Trade Initiative; and corporates such as Confederation of Indian Industry (CII), Hindustan Lever (HUL), Tata Global Beverages (TGP) and AV McCormick.

A Project Steering Committee (PSC) will be constituted to serve as the project oversight, advisory and support body for the project and to ensure representation of key stakeholder groups and interests in the project implementation.

The project will follow UN Environment standard monitoring, reporting and evaluation processes and procedures. Reporting requirements and templates are an integral part of the UN Environment as well as IUCN legal instruments, to be signed with the Executing Agencies and the GEF Implementing Agencies. The project M&E plan will be consistent with the GEF Monitoring and Evaluation policy.

Coordination with GEF and other initiatives will be ensured through the MoEFCC, UN Environment and IUCN, who are engaged in related initiatives in India. In addition to the programmes and initiatives mentioned in section 2 on baseline projects, this will include coordination and sharing of lessons learned with other national and sub-national initiatives and GEF-funded projects. Initial research has identified a number of projects, whose coordination potential or best practice are of benefit to incorporate with the proposed project, and which will be further specified and confirmed in the PPG phase (see Annex F for listing).

Annex F

Projects Identified as Having Important Coordination Potential

Project Title	G E F I n v e s t m	P e r i o d	A g e n c y	Project Objectives and Activities

	e n t			
Conservation and Management of Pollinators for Sustainable Agriculture through an Ecosystem Approach Countries in Brazil Ghana India Kenya Nepal Pakistan South Africa	U S \$ 8, 5 1 0, 6 8 2	2 0 1 3 - 2 0 1 8 8	U N E P a n d F A O	To harness the benefits of pollination services provided by wild biodiversity for human livelihoods and sustain agriculture, through an ecosystem approach in selected countries
Biodiversity Conservation and Rural Livelihoods Improvement	U S \$ 1 1, 5 0 0, 0 0 0	2 0 0 9 - 2 0 1 4	W o r l d B a n k	To develop and promote news models of conservation at the landscape scale through enhanced capacity and institution building for mainstreaming biodiversity conservation outcomes
Mainstreaming Conservation and Sustainable Use of Medicinal Plant Diversity in Three Indian States	U S \$ 4, 9 3 5, 0 0 0	2 0 0 8 - 2 0 1 5 0	U N D P	This project strengthened the long-term conservation and sustainable use of India's medicinal plant diversity, particularly of its globally significant species. The project mainstreamed conservation and sustainable use objectives into forest management policy and practice at the national, state, and local level in three Indian states: Arunachal Pradesh, Chhattisgarh, and Uttarakhand. The project worked with at least 400 species of medicinal plants, including at least 80 globally significant species, several of which are critically endangered.
Strengthening the Enabling Environment for BD Conservation and Management in India	U S \$	2 0 1	G E F	To provide assistance to India in meeting its national reporting requirements to CBD, including revision of National Biodiversity Strategy and Action Plan and preparation of the fifth National Report for Biodiversity and second National Report for Biosafety

	2 4 6, 0 0 0	2 - 2 0 1 7	- S E C	
Integrated Management of Wetland Biodiversity and Ecosystem Services for Water and Food Security	4, 2 4 6, 5 7 5	2 0 1 3 - 2 0	U N E P	Enhanced management effectiveness of wetlands of national and global importance through strengthening their management partnership, economic case and mainstreaming at landscape level
Mainstreaming Agrobiodiversity Conservation and Utilization in Agricultural Sector to Ensure Ecosystem Services and Reduce Vulnerability	3, 1 9 6, 3 4 7	2 0 1 5 - 2 0	U N E P	To mainstream the conservation and use of agrobiodiversity for resilient agriculture and sustainable production to improve livelihood and access and benefit sharing capacity of farmer communities across four agro-ecoregions of India.
Developing an Effective Multiple Use Management Framework for Conserving Biodiversity in the Mountain Landscape of the High Ranges, Western Ghats	6, 3 6 3, 6 0 0	2 0 1 4 - 2 0	U N D P	To protect biodiversity of the High Range Mountain Landscape (HRML) of the southern Western Ghats in peninsular India from existing and emergent threats through building an effective collaborative governance framework for multiple use management.
Integrated SLEM Approaches for Reducing Land Degradation and Desertification	U S \$ 4, 4	2 0 1 4	W o r l d	To scale up sustainable land and ecosystem management practices in selected semi-arid areas and to improve the monitoring of land degradation and desertification. Land users adopting sustainable land management practices as a result of the project; Streamlining of reporting on national indicators on land use/land use change. At least five States start using the online database/MIS built through project; Establishing a national knowledge platform for land and ecosystem management practices; Strengthening institutional arrangements for land and ecosystem management; Improving the capacity of land users and local institutions for land and ecosystem management; Improving the capacity of national and sub-national institutions for land and ecosystem management; Improving the capacity of national and sub-national institutions for land and ecosystem management.

	9 0 0, 0 0 0 0	- 2 0 1 9 0	B a n k	wledge exchange platform (community of practice) with at least 10 SLEM best practices disseminated using the knowledge platform
India Ecosystems Service Improvement Project	U S \$ 2 4 m ill i o n	2 0 1 5 - 2 0 2 0	W o r l d B a n k	To strengthen the institutional capacity of the Department of Forestry and community organizations. Components and activities include: to enhance forest ecosystem services and improve the livelihoods of forest dependent communities in Central Indian Highlands; Strengthening capacity and skills of government institutions for effective delivery of forestry and land management programs; Improving forest quality and productivity; and Scaling up of integrated sustainable land and ecosystem management (SLEM) approaches for reducing land degradation and desertification.
Green Agriculture: Transforming Indian agricultural for global environmental benefits and the conservation of critical biodiversity and forest landscapes	U S \$ 3 3, 5 5 8, 7 1 6	2 0 1 6 - 2 0 2 1	F A O - G E F	To catalyze transformative change for India's agricultural sector to support achievement of national and global environmental benefits and conserve critical biodiversity and forest landscapes

7. Consistency with National Priorities

Is the Project consistent with the National Strategies and plans or reports and assessments under relevant conventions

Yes

If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc

The proposed project is aligned with India's current draft National Action Programme (NAP) to Combat Desertification, Land Degradation and Drought of 2015-2030. The document recommends adoption of sustainable land management practices, diversification to high value agriculture for food and nutritional security, focus on small and marginal farmers, regions lagging behind such as dryland/ rainfed areas and empowerment of women in agricultural sector. The GoI is currently in the propose of setting the LDN targets under UNCCD and the proposed project will also align with the LDN targets and help the government in future reporting towards UNCCD.

India has demonstrated a strong commitment to upholding the Convention on Biological Diversity (CBD), with the country having submitted its Sixth National Report (NR5) to CBD showing tremendous progress towards meeting the global targets. The Indian National Biodiversity Action Plan (NBAP) identifies threats to biodiversity conservation and has identified actionable strategies to address them. The project is aligned with many of the NBAP priorities, such as Section 3.1 which states that solutions must be found to address habitat fragmentation, degradation, and loss; Section 4.1 which focuses upon strengthening and integration of in situ, on farm and ex situ conservation; and Section 5.1 which directs attention towards the need to identify hotspots of agro-biodiversity under different agro-ecozones and cropping systems and promote on farm conservation; provide economically feasible and socially acceptable incentives such as value addition and direct market access in the face of replacement by other economically remunerative cultivars; and, develop mutually supportive linkages and increased coherence between in situ, on farm and ex situ conservation programs; while Section 5.9 identifies the need to build national capacities for biodiversity conservation and appropriate use of new technologies.

There is further alignment to the following Action Points under the sections (iii) Develop appropriate models for on-farm conservation of livestock herds maintained by different institutions and local communities; "Augmentation of natural resource base and its sustainable utilization: Ensuring inter and intra-generational equity": (i) Encourage adoption of science-based, and traditional sustainable land use practices, through research and development extension of knowledge, pilot scale demonstrations and large scale dissemination, including farmers' training, and where necessary, access to institutional finance; (ii) Encourage agro-forestry, organic farming, environmentally sustainable cropping patterns, and adoption of efficient irrigation techniques; "Integration of biodiversity concerns in economic and social development": (i) Promote organic farming of traditional crop varieties through research in and dissemination of techniques for reclamation of land with prior exposure to agricultural chemicals, facilitating marketing of organic produce in India and abroad, including by development of transparent, voluntary and science-based labelling schemes; "Strengthening implementation of policy, legislative and administrative measures for biodiversity conservation and management": (i) Review enabling policies to prevent transfer of prime agricultural land to non-agricultural purposes, and promote sustainability of agricultural lands".

The project will also contribute towards several NBSAP National Biodiversity Targets (NBTs) that India has set. The NBTs are aligned directly with the global Aichi targets. Some of the applicable targets include the following: measures are adopted for sustainable management of agriculture, forestry and fisheries; strategies for reducing rate of degradation, fragmentation and loss of natural habitats are finalized and actions put in place for environmental amelioration and human well-being; ecosystem service, especially those relating to water, human health, livelihoods and well-being are enumerated and measures to safeguard them are identified, taking into account the needs of women and local communities, particularly the poor and vulnerable sections; and, a significant proportion of the country's population, especially the youth, is aware of the values of biodiversity and the steps they can take to conserve and use it sustainably

8. Knowledge Management

Outline the Knowledge management approach for the Project, including, if any, plans for the Project to learn from other relevant Projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.

Knowledge management is at the core of the project with Component 4 dedicated to this. It is also cross-cutting across the various other components as well. A major focus in Component 4 of Knowledge Management is in knowledge sharing from the project landscapes to other relevant stakeholders, both nationally and internationally. This will ensure the sustainability of the project results as well as help in upscaling and mainstreaming of the learnings across the country. Policy briefs, outreach materials and informative brochures will be developed as part of the project's knowledge management component and best practices from the project landscapes will be identified, documented and disseminated for cross-learning opportunities. The project will also organize a national consultation on sharing best practices on LDN, SLM and ZBNF to facilitate cross-learning and replication, specifically ZBNF. These will also help in identifying pathways for further scale up of SLM investment in the country. Lessons learned from the project will be shared amongst agricultural producers, private sector, policy decision-makers and civil society organizations through undertaking case studies of success stories, participation in national, regional and international conferences on SLM and responsible business, and targeted communications in collaboration with companies championing the project's objectives.

The GEF Knowledge Management strategy will guide the project KM approach. The project will include a comprehensive monitoring and evaluation component, which will be informed by the results of the context assessment and refined project theory of change. The project's M&E plan will, first and foremost, provide reliable evidence to track progress, facilitate management decisions, and inform adaptive management throughout the life of the project. Creation of impacts will form the basis for knowledge management and dissemination of best practices. Whereas monitoring data is collected on a quarterly and annual basis to answer questions about trends in the project's performance, impact creation uses more rigorous methods, including control groups when possible, to more empirically test assumptions in the project's theory of change and provide evidence on the attributable impacts of a project or intervention. This approach will be used to evaluate the effects of best SLM practices on land degradation.

Part III: Approval/Endorsement By GEF Operational Focal Point(S) And Gef Agency(ies)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the Operational Focal Point endorsement letter with this template).

Name	Position	Ministry	Date
Dr Manju Pandey	Joint Secretary and GEF OFP India	MINISTRY OF ENVIRONMENT, FORESTS AND CLIMATE CHANGE	4/5/2019

ANNEX A: Project Map and Geographic Coordinates

Please provide geo-referenced information and map where the project intervention takes place

PROJECT'S TARGET SITES

State: Karnataka

Districts: Kodagu and Chikmagalur

Target crops: Coffee, spices

Maps:

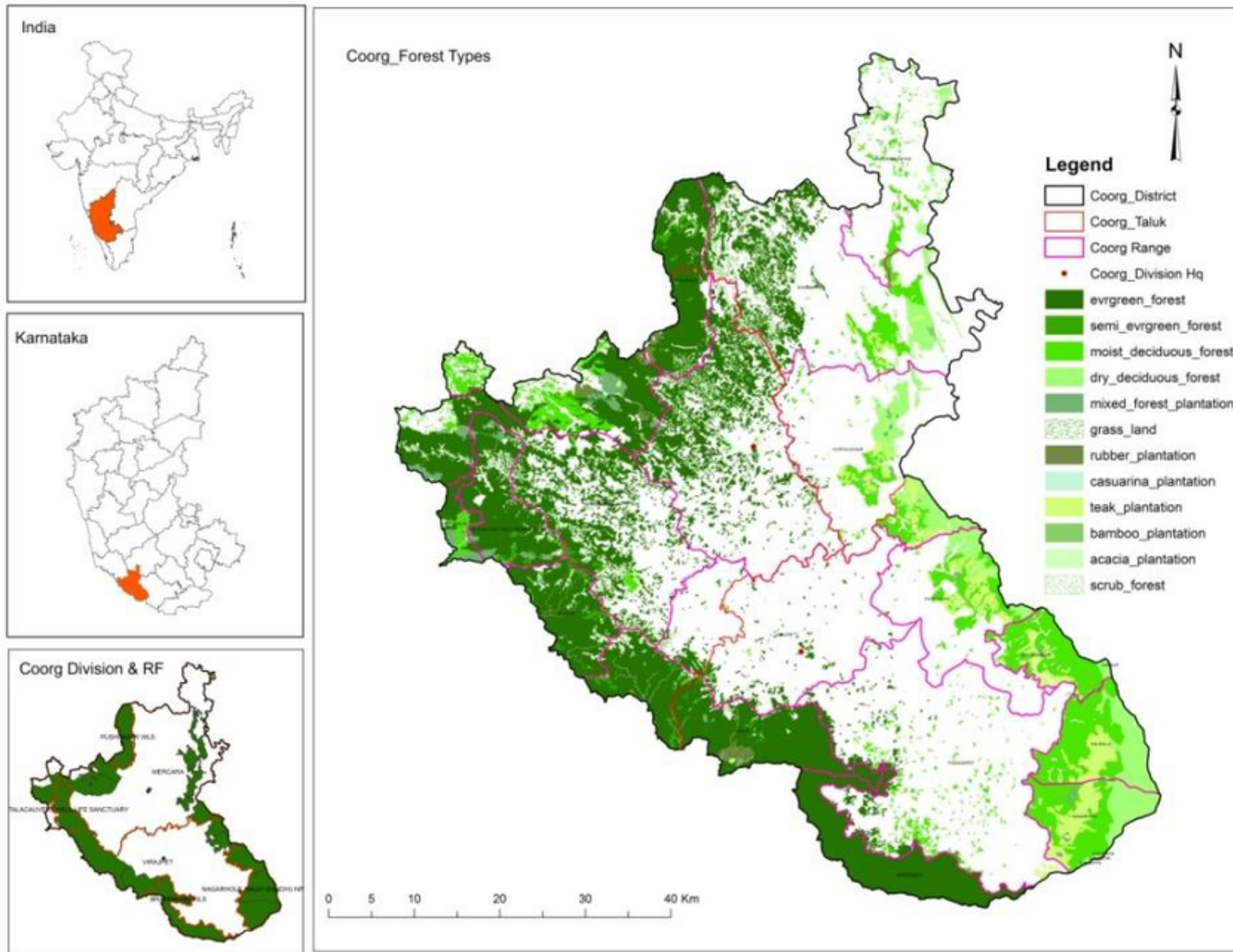


Figure 1. Location map of Kodagu/Coorg district showing Taluk-Division-Range and reserve forests

*Land use land cover mapping using Geo-informatics of Kodagu District, Karnataka
Megokedono Vakha et al.,*

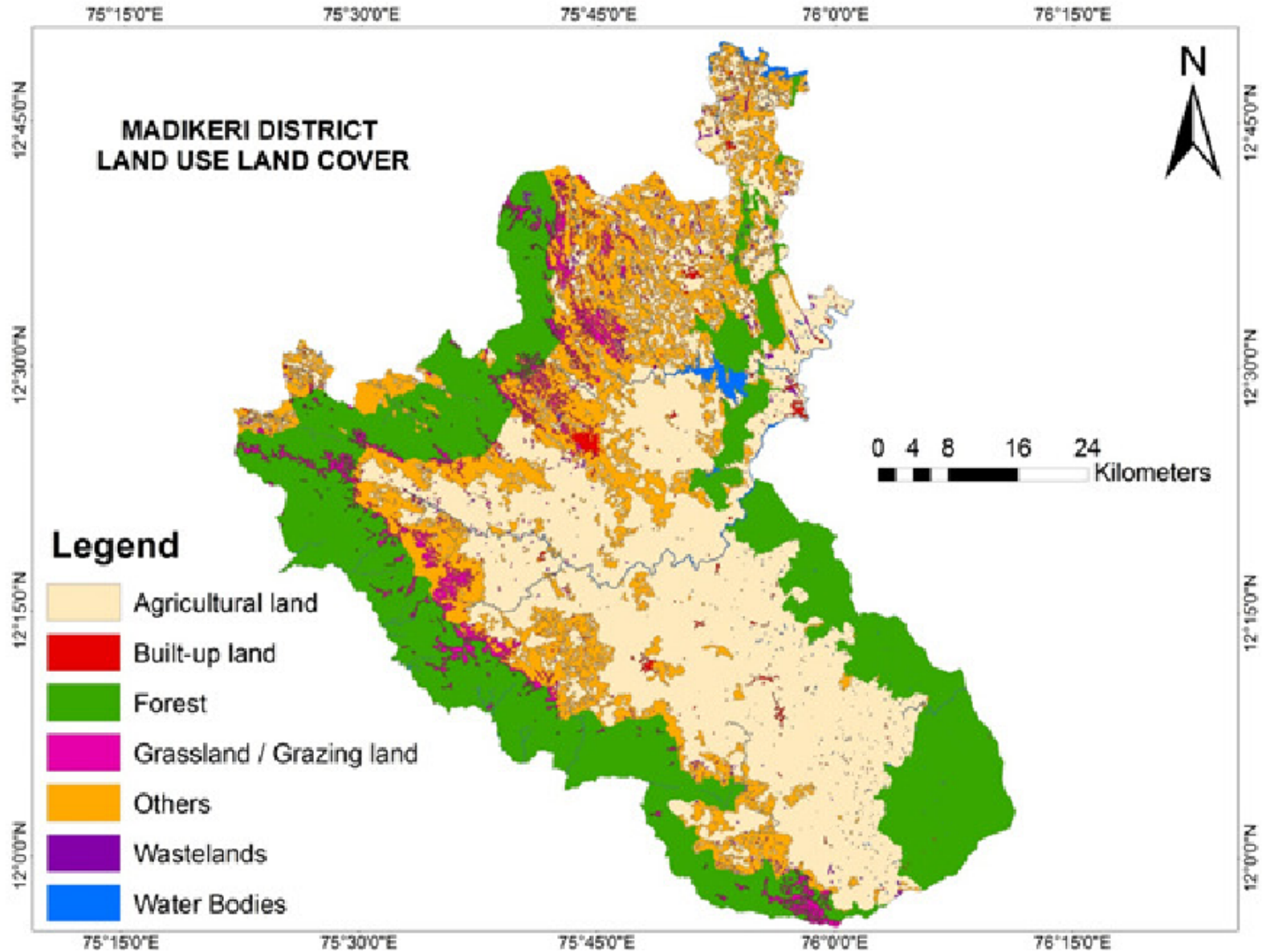


Figure 2. Land Use Land Cover map of Kodagu district

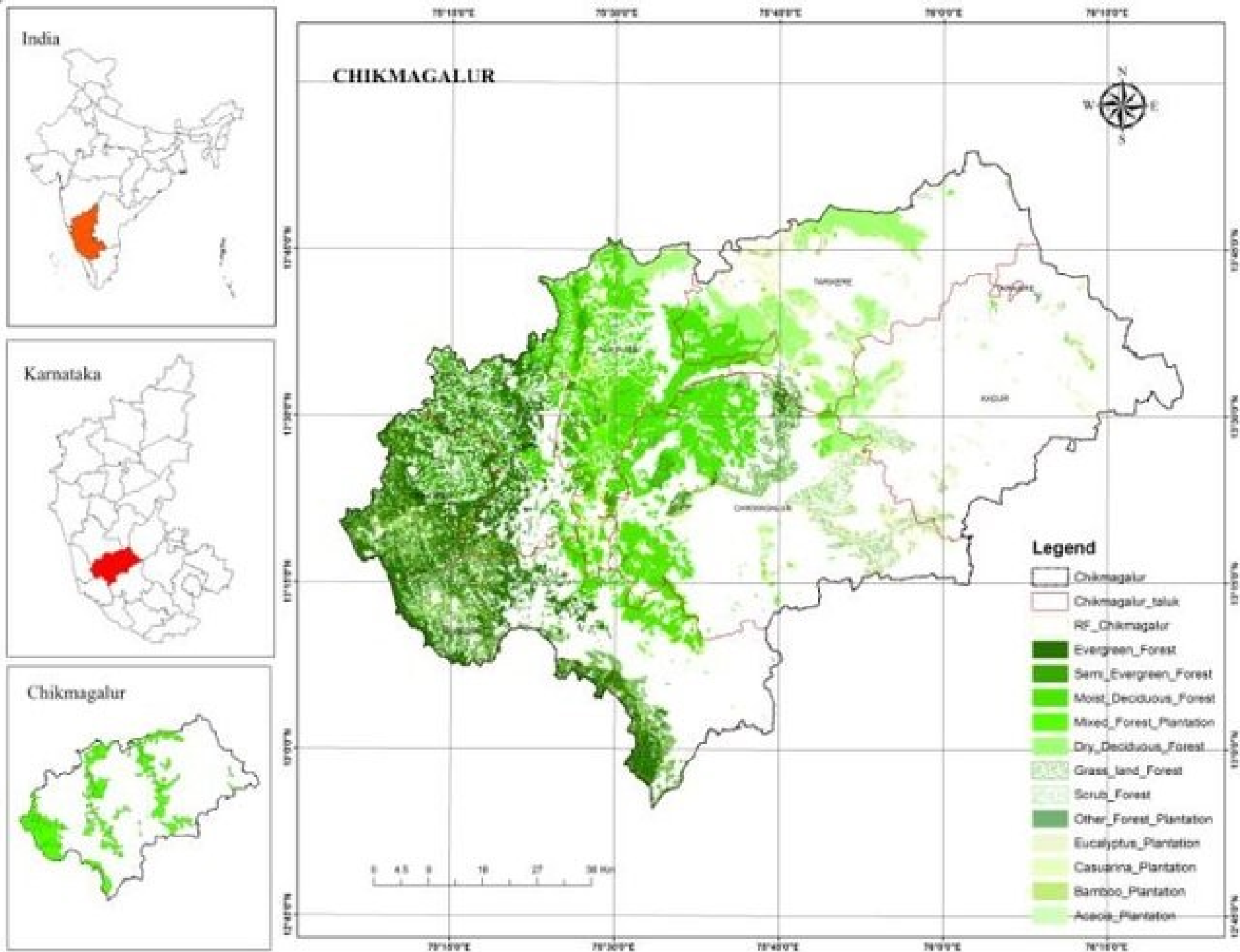
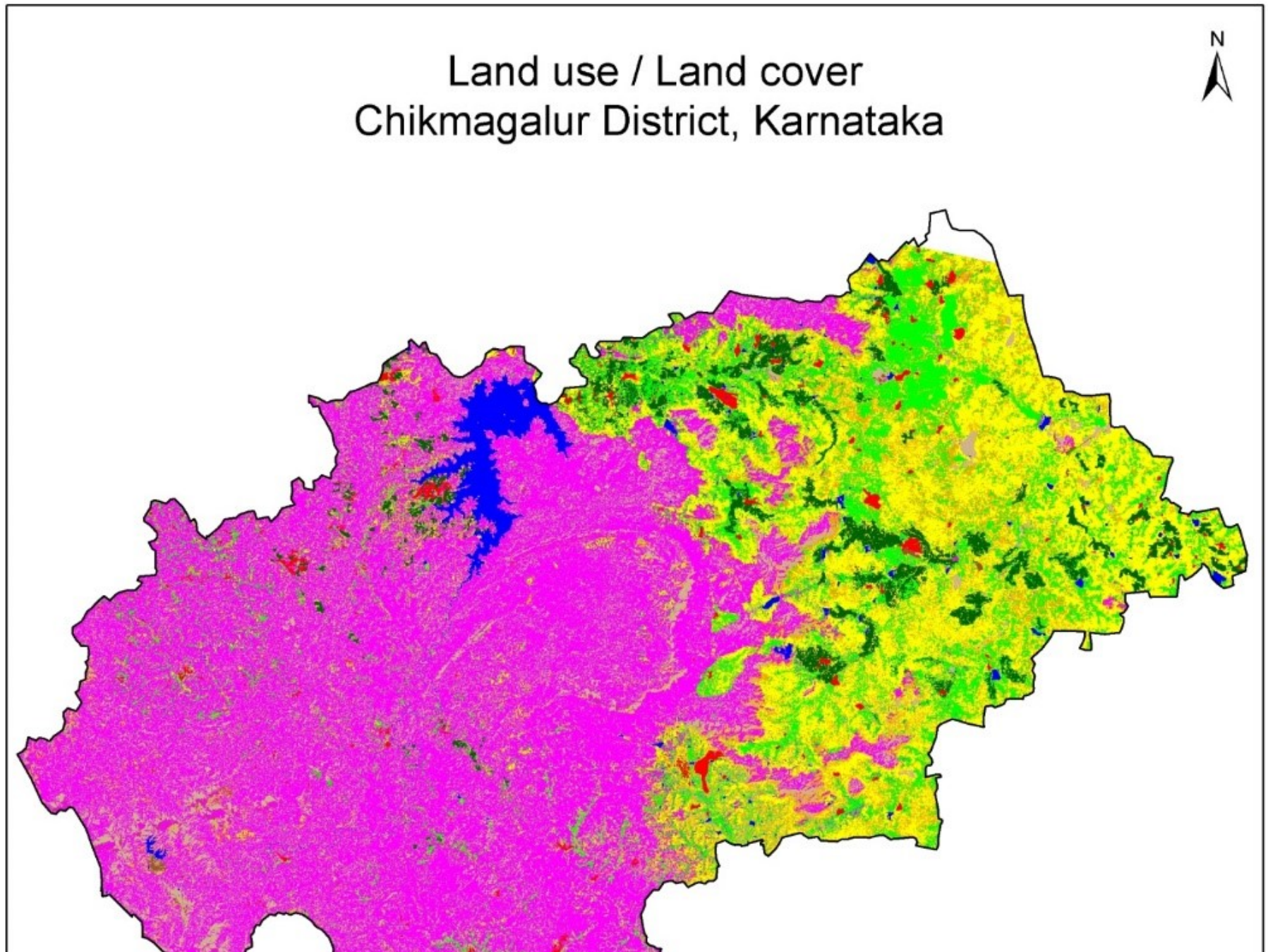


Figure 3. Location map of Chikmagalur district showing Taluk-Division-Range and reserve forests



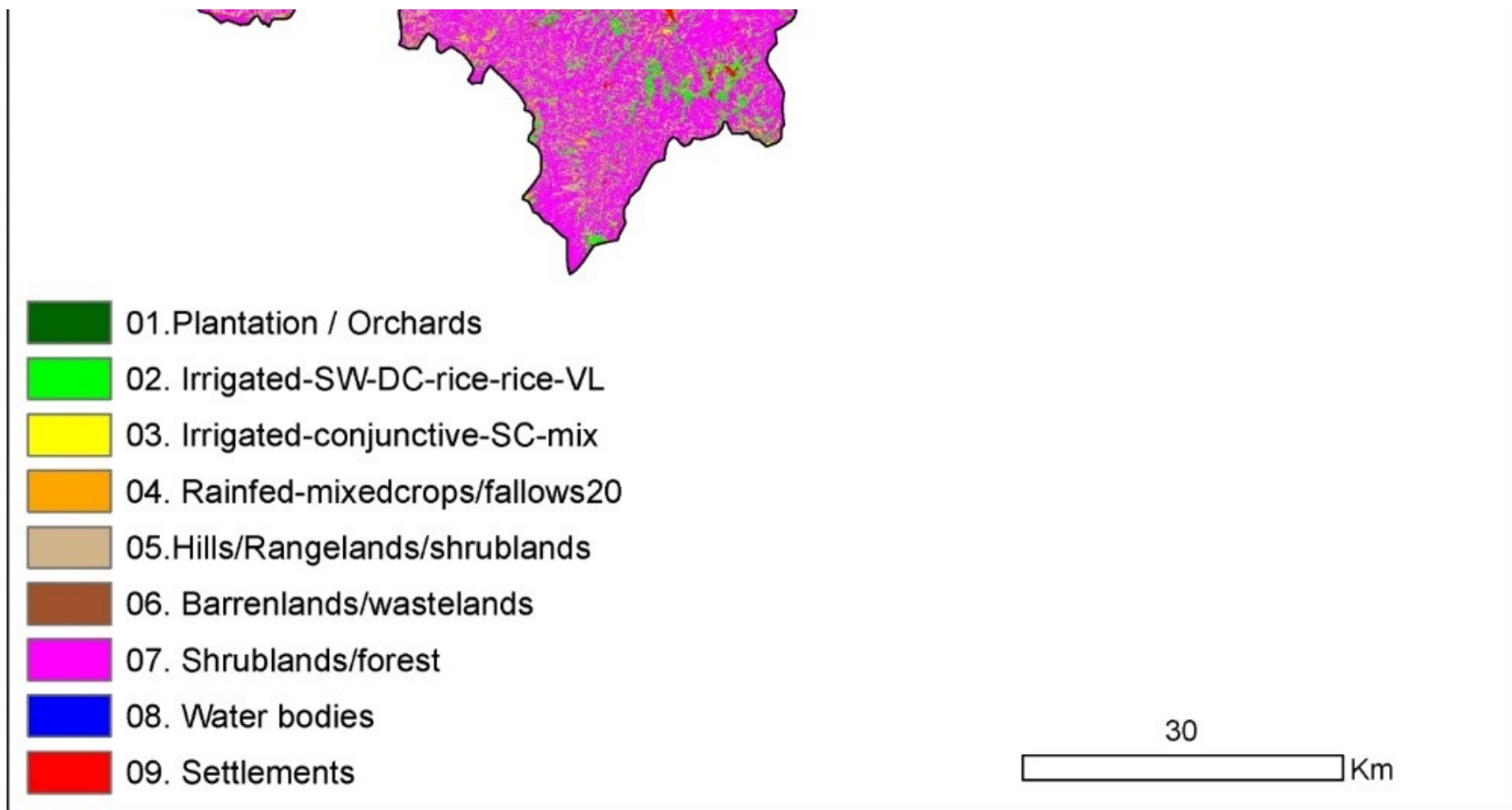


Figure 4. LULC map of Chikmagalur

Biodiversity:

Western Ghats is an important geological landform, traversing six States: Gujarat, Maharashtra, Goa, Karnataka, Tamil Nadu and Kerala. It has the status of 'Global Biodiversity Hotspot' as it encompasses endemic species of flowering plants, endemic fishes, amphibians, reptiles, birds, mammals and invertebrates. It is also an important center of evolution of economically important domesticated plant species such as pepper, cardamom, cinnamon, mango and jackfruit. UNESCO has included certain identified parts of Western Ghats in the UNESCO World Natural Heritage List because it is a center of origin of many species as also home for rich endemic biodiversity. According to UNESCO, the Western Ghats, which are older than the Himalayas, are home to at least 325 globally threatened flora, fauna, bird, amphibian, reptile and fish species. It has been recognized as one of the world's eight 'hottest hotspots' of biological diversity.

To study the preservation of the ecology, environmental integrity and holistic development of the Western Ghats in view of their rich and unique biodiversity, MoEFCC constituted a 'High Level Working Group (HLWG)' under the Chairmanship of Dr. K. Kasturirangan, Former Member Planning Commission in 2012. The report submitted in April 2013, noted that approximately 60% of the Western Ghats region is under cultural landscape i.e. it has human dominated land use of settlements, agriculture and plantations (other than forest plantations) and around 40% of the land area is under natural landscape. Of the natural landscape, the biologically rich areas, with some measure of contiguity are roughly 37% of the Western Ghats which is 59,940 km². The HLWG identified this 37% of natural landscape having high biological richness, low forest fragmentation, low population density and containing Protected Areas (PAs), World Heritage Sites (WHSs) and Tiger and Elephant corridors as an Ecologically Sensitive Area (ESA) ^[1].

The HLWG, because of unprecedented threats to natural landscape of Western Ghats region by development projects and urban growth, specifically recommended a 'non-tolerance policy' with respect to highly interventionist and environmentally damaging activities like mining or polluting industries. It recommended phasing out current mining projects within five years, or when mining leases were about to expire, that infrastructure and development projects be subject to environmental clearance, and that villages in ESAs be involved in decision making regarding future projects.

MoEFCC, responding to these recommendations, issued a draft notification earmarking 60,000 km² or 37% of the Ghats as ecologically sensitive. It identified Karnataka as having the largest ESA (20,668 km²) of the six states. 160 villages in Chikmagalur and over 50 villages in Kodagu have been included as ESAs. The selected landscapes under this project will cover these areas.

Kodagu is rich with wildlife and has three wildlife sanctuaries (Brahmagiri, Talakaveri, and Pushpagiri) and one national park: Nagarhole (Rajiv Gandhi National Park). The flora includes protected timber species (Toona ciliate -Indian mahogany), teak, sandalwood and other numerous tree species. The fauna counts endangered species of the Asian elephant, tiger, leopard, dhole, and gaur. Kodagu also includes a wide variety of birds; around 300 bird species have been sighted and reported over the years. The mountains in Chikmagalur form part of the Western Ghats and are the source of the rivers Tunga and Bhadra. Mullayanagiri, which is the highest peak in Karnataka, is located in the district and is abundant with waterfalls and cultural heritage. The Kudremukh National Park and Bhadra Wildlife Sanctuary are also located in Chikmagalur.

Agriculture sector:

The agricultural sector of Karnataka is characterized by vast areas of drought-prone region and sporadic patches of irrigated area. Thus, a large portion of agricultural land is exposed to the vagaries of monsoon with severe agro-climatic and resource constraints. 64.60% of the total geographical area is under cultivation (30,900 km²), of which only 26.5% is irrigated. Karnataka ranks fifth in India in total area under horticulture, is the fifth largest producer of vegetable crops (8% of national production), third largest in fruit crops (12%), third largest producer of sugar, second in milk and floriculture, and fourth in sugarcane production.

Karnataka is one of the largest spice producers in India. A total of 189,356 ha of land is under spice production and produces about 331,377 tons of spices. Karnataka is the largest producer of pepper, which is produced in both Chikmagalur and Kodagu districts. In 2014-15 Karnataka produced 33,000 tons. Inadequate application of fertilizers or manures and dry spells are the causes of rapidly declining yields. The application of organic and inorganic nutrients is essential as a part of scientific management that helps in maintenance of soil health and production of the crops. Chikmagalur and Kodagu are among the main cardamom growing districts of Karnataka but there has been a decline in cardamom production, due to inadequate application of organic and inorganic nutrients and longer dry spells.

Karnataka is the largest coffee producer in India (53.83%), and the industry engages close to 30% of the rural population. The area under coffee plantations in India has increased by more than three times, from 120,320 ha in 1960-61 to 454,720 ha in 2017-18 (provisional). The industry is driven by the enterprise of around 280,241 coffee growers, out of which 99% are small growers, while 1% are medium to large growers. These plantations employ an average of around 659,865 people on a daily basis (2017-18)^[2]. Kodagu district is the largest producer (116,500 tons), followed by Chikmagalur (coffee was first cultivated in India in the Chikmagalur district).

The coffee agro-forestry systems of Kodagu are one of the richest agro-forests in the world, with about 270 species of shaded trees inventoried (CAFNET). In the coffee agroforests, spices such as black pepper, cardamom, and vanilla are cultivated. Many other crops are grown, including rubber, teak, and cocoa. There are also large areas of natural forest, especially in the forest reserves in the south and east.

However, researchers have observed a rapid reduction in the canopy cover in many coffee farms, due to increased felling and timber production. Indian coffee exporters are facing strong competition from low cost coffee producers, especially Vietnam. To be competitive, the planters often prefer to balance the income through plantation of more valuable wood trees and pepper production. A recent trend is to plant Silver Oaks instead of native tree species.^[3] The species has a strong demand in the market, grows faster and is good for pepper production.

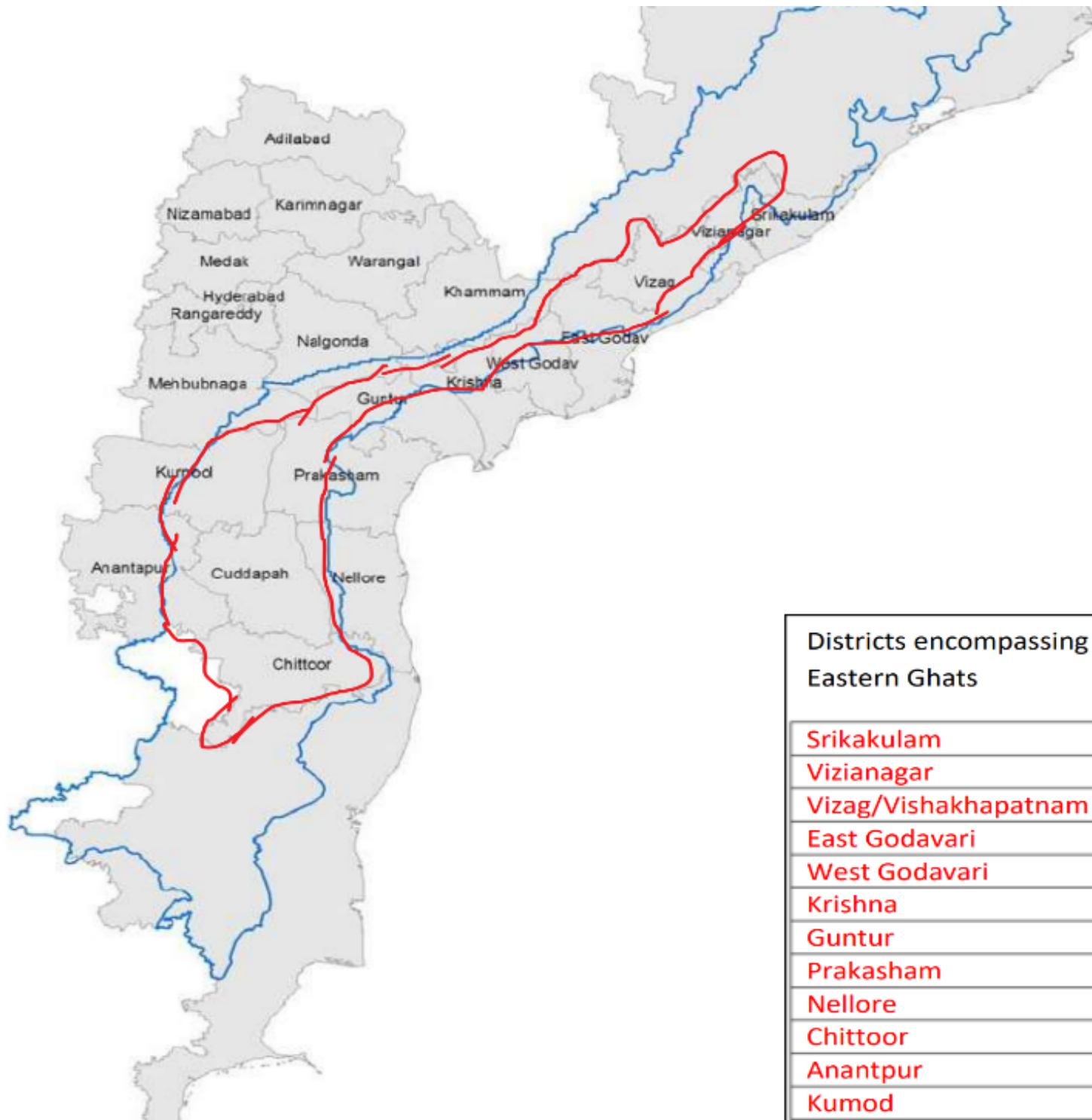
The marketing and production of coffee is affected by climatic conditions and price fluctuations over the years. Without support from government or other authorities, the smallholders are suffering from declining yields and are often in debt as input costs are constantly rising.

Agriculture is the core economic activity in Chikmagalur, with coffee cultivation forming the major part of it. Other important crops grown include rice, ragi, jowar, maize and minor millets, pulses like red gram, horse gram, green gram, avrekai (Hyacinth Beans), black gram and Bengal gram. Oil seeds (groundnut, sesamum, sunflower, castor) and commercial crops (sugarcane and cotton) are also grown in the district.

Coffee is cultivated on approximately 85,465 ha of land, and there are around 15,000 coffee growers in the district, of which 96% are smallholders with plots of 4 ha or less. Studies have revealed Hexa Chloro Haxene (HCH) contamination in the ponds near coffee plantations in Chikmagalur district ranging from 0.02-0.2 ppm. These pesticides enter the food chain through fruits, vegetables and other crops and once the concentration increases further, these lands will be considered contaminated and cannot be safely cultivated for food production.

Both Arabica and Robusta coffee are produced. Rainfall during February-July is crucial for both varieties for breaking dormancy and blossoming, to assist fruit set and for fruit swelling. Robusta coffee can withstand higher temperature and requires relatively high relative humidity than Arabica. Compared to Robusta, Arabica coffee can grow well even at higher elevations and steeper slopes. Both species prefer very deep, well drained, non-gravelly, fine-loamy to clayey soils having slightly to moderately acid reaction, high organic carbon contents, high base saturation and good water and nutrient retention capacities. Studies show that many plantations in Kodagu and Chikmagalur have low carbon content which reduces the coffee production.^[4]





Extent of Eastern Ghats in Andhra Pradesh

Extent of Eastern Ghats

Districts encompassing Eastern Ghats

Srikakulam
Vizianagar
Vizag/Vishakhapatnam
East Godavari
West Godavari
Krishna
Guntur
Prakasham
Nellore
Chittoor
Anantpur
Kumod

State: Andhra Pradesh

Districts: Srikakulam, Vizianagar, Vishakhapatnam, East Godavari, West Godavari, Krishna, Guntur, Prakasham, Nellore, Chittoor, Anantpur, Kumod. These are districts that fall within the Eastern Ghats in AP. The total extent of Eastern Ghats in Andhra Pradesh is 10 million hectares. Of this, the total land available for cultivation in and around Eastern Ghats is 4.5 million hectares, which will include the target landscape(s) for the project within AP.

Target crops and/or cropping systems: Cashew, coffee, tamarind, jack fruit, turmeric, millets, groundnut, pulses, dry paddy

Biodiversity:

Due to its very high levels of biodiversity both flora and fauna, and existence of key habitats for protected wildlife, Andhra Pradesh has established a large area of land, both terrestrial as well as coastal wetlands included in the protected Area system including

Ecological hotspots in Eastern Ghats of Andhra Pradesh National Parks:

1. Sri Venkateswara National Park: 35,300 ha
2. Rajiv Gandhi National Park: 2,400 ha
3. Papikonda National Park: 1,0128,500 ha

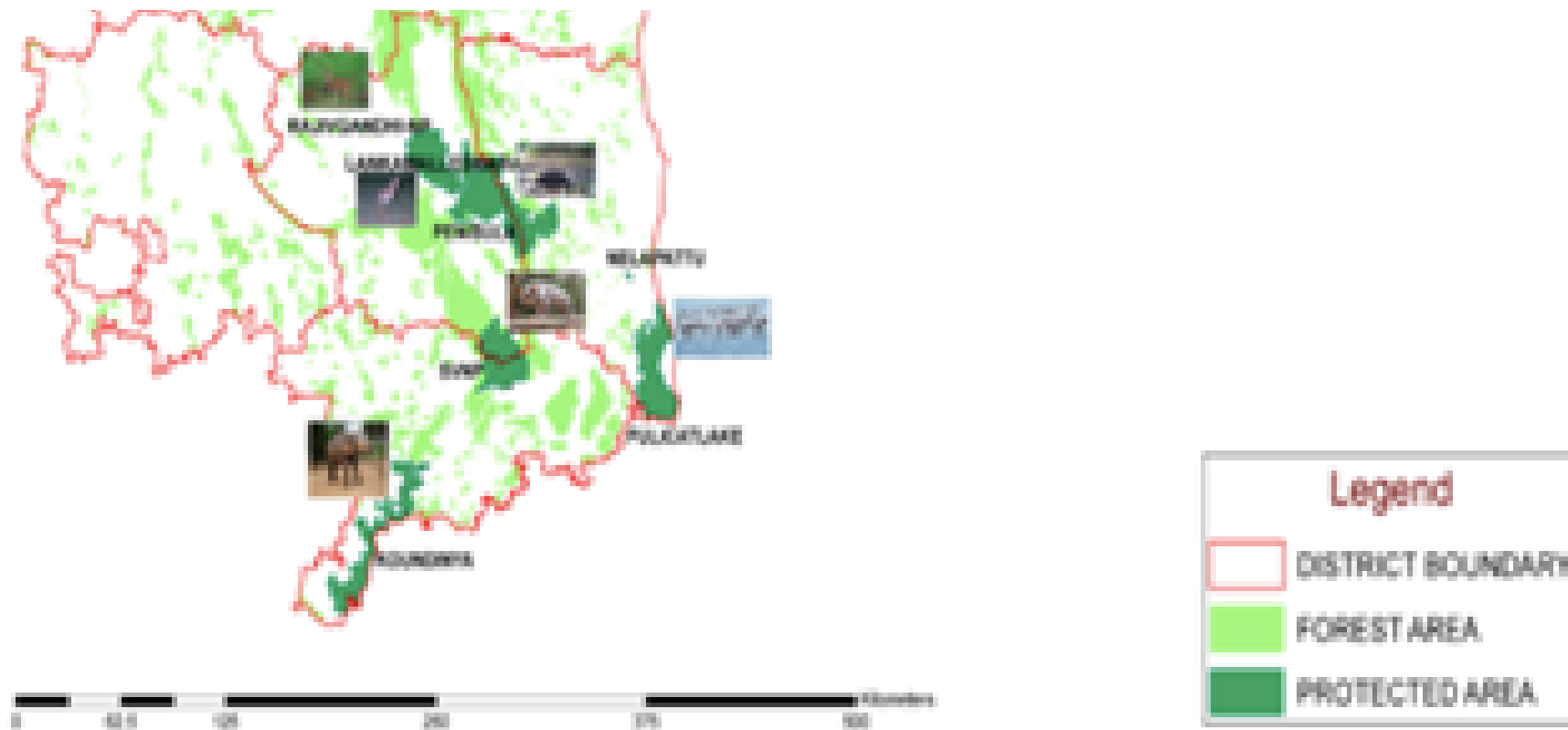
Sanctuaries:

4. Coringa WLS (East Godavari).
5. Kolleru WLS (West Godavari & Krishna).
6. Krishna WLS (Krishna).
7. Rajiv Gandhi WLS (Tiger Reserve) (Kurnool, Prakasam & Guntur).
8. Rollapadu WLS (Kurnool).
9. Gundla Brahmeswaram WLS (Extended Core) (Kurnool & Prakasam).
10. Sri Lankamalleswara WLS (Kadapa & SPSR Nellore).
11. Nelapattu WLS (SPSR Nellore).
12. Pulicat WLS (SPSR Nellore).
13. Koundinya WLS (Chittoor).

14. Sri Venkateswara WLS (Chittoor)
15. Kambalakonda WLS (Visakhapatnam)
16. Penusila Narasimha WLS (SPSR Nellore & Kadapa)
17. Biosphere Reserves
18. Seshachalam

MAP SHOWING PROTECTED AREAS IN ANDHRA PRADESH





Mangroves:

Of the total forest area in Andhra Pradesh, 58,200 hectares are under the mangrove forests, which accounts 0.9% of the total forest area of the state.

Place	Area in ha
Krishna	15,600
Godavari	24,100
Rest	18,500
Total	58,200

Andhra Pradesh has a high remaining forest cover with 3.7 million hectares of forest landscapes:

District wise forest land area details			
District	Total Geographical Area (in '000' hectares)	Forest (in '000' hectares)	Barren and uncultivable area (in '000' hectares)
Anantapur	1913	197	166
Chittoor	1515	452	153
Cuddapah	1536	501	222
East Godavari ^T	1281	466	83
Guntur	1139	162	32
Krishna	873	76	37
Kurnool	1765	341	127
Nellore	1308	272	82
Prakasam	1762	459	153
Srikakulam ^T	584	69	48
Vijainagaram ^T	654	119	73
Vishakhapatnam ^T	1116	441	130
West Godavari ^T	851	133	40
Total Andhra Pradesh	16297	3688	1346

Agriculture sector:

The state is divided into 9 agro climatic regions. Agriculture plays an important role not only in the economy but also for achieving food security for the state and also for the country. The sector plays an important role in the livelihoods of people as 63% of the population in AP live in rural areas and depend on agriculture and related livelihood opportunities. In terms of sector-wise contribution to GDP, services make up 46%, industry 10% and agriculture 30%.

Andhra Pradesh's economy is mainly dependent on agriculture and livestock. For 2016 – 2017 agriculture and allied sectors grew at 14.03 percent – with horticulture growing at 16.79 percent^[5]. 62 percent of the population or approximately 420,000 families are employed in agricultural and related activities. Rice (paddy) is the major crop in the state including sugarcane, cotton, mango, tobacco, maize, pulses, sunflower and peanuts.

Approximately, 71,356 hectares are under coffee cultivation in Andhra Pradesh. These are largely hilly areas that are cultivated by indigenous communities and produce high quality Arabica, which is suited to the climatic conditions of Visakhapatnam district. Coffee cultivation is a growing and viable income source evident by the fact that from 2016 to 2018, coffee yield from non traditional growing areas in Andhra Pradesh has risen and the area under cultivation has increased by 8,800 hectares[6].

In terms of cashews, Andhra Pradesh has the second highest cashew production in India. The cashew industry is almost entirely export oriented with USA, UAE, Netherlands, Saudi Arabia and Japan being the main markets[7]. About 46,913 hectares of area is under cashew cultivation in Andhra Pradesh with an annual production of 12,500 tons of raw nuts[8]. Cashew has been identified as one of the crops in the state that has the fastest pace of growth in the northern parts of the region due to good economic returns for farmers and high procurement prices along with the fact that the specific varieties grown in Andhra Pradesh are well suited to the climate of the area and require lower quantities of water[9].

India supplies an estimated 80 percent of global demand for turmeric of which 60 percent of production is in Andhra Pradesh. While the Spice Board of India's efforts in opening new markets for spice flavored chocolates, spice candles and spices-based cosmetic products have received consistent demand from domestic consumers, the spices sector in Andhra Pradesh is increasingly affected by changing and unpredictable weather patterns, high production and input costs along with the presence of chemical pesticide residues, which limit the ability of spices such as turmeric to access higher value supply chains[10] as compared with other states in the country.

Similarly, agricultural products in Andhra Pradesh like paddy, tamarind, jack fruit, etc, are grown in landscapes where heavy extraction of groundwater, degradation of soil fertility and unsustainable intensification of farming through the usage of chemical based pesticides and fertilizers are resulting in significant negative environmental and social impacts. However, with growing awareness about health impacts amongst consumers and rising demand for natural and chemical-free products, the availability of naturally grown and chemical residue free crops such as cashews, coffee, turmeric, and paddy and so on is bringing several large-scale retailers to Andhra Pradesh like Big Basket among various entrepreneurial ventures for ZBNF food products.

[1] An ecological sensitive area is defined by the MoEFCC as "a bio-climatic unit (as demarcated by entire landscapes) in the Western Ghats wherein human impacts have locally caused irreversible changes in the structure of biological communities (as evident in number/ composition of species and their relative abundances) and their natural habitats."

[2] <https://www.teacoffeespiceofindia.com/coffee/coffee-statistics>

[3] Environmental Prospective in Kodagu-How to enhance biodiversity conservation and watershed resources management-Pierre Marie Aubert and Edouard Michel, 2012

[4] https://www.isslup.org/Volume_19_Number_1/Characteristics%20of%20coffeegrowing%20soils%20and.pdf

[5] 'Tracing Andhra Pradesh's Agricultural Growth', National Interest, 2017.

[6] The Hindu: Business Line (2018) 'Coffee yield from AP likely to be higher this year'. <https://www.thehindubusinessline.com/economy/agri-business/coffee-yields-from-ap-likely-to-be-higher-this-year/article23657919.ece>

[7] Directorate of Cashewnut and Cocoa Development, 2019. <https://www.dccd.gov.in/Content.aspx?mid=15&tid=1>

[8] Rao, S-N. (n.d.) The Palasa Cashew Manufactures Association. Presentation on 'Palasa Cashew Processing Cluster and its Impact on Employment & Environment and lessons'.

[9] The Times of India (2017) 'Farmers cash in on cashew in north coastal Andhra Pradesh'. http://timesofindia.indiatimes.com/articleshow/58387033.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

[10] The Hindu Business Line (2018) 'Spices Board goes digital in Andhra Pradesh'. <https://www.thehindubusinessline.com/economy/agri-business/spices-board-goes-digital-in-andhra-pradesh/article9444582.ece>

