



Crop Diversity Conservation for Sustainable Use in Indonesia

Part I: Project Information

GEF ID

10511

Project Type

FSP

Type of Trust Fund

GET

CBIT/NGI

CBIT

NGI

Project Title

Crop Diversity Conservation for Sustainable Use in Indonesia

Countries

Indonesia

Agency(ies)

FAO

Other Executing Partner(s)

Executing Partner Type

Other Executing Partner(s)

Indonesian Centre for Agricultural Biotechnology and Genetic Resources Research and Development (Ministry of Agriculture) DG Natural Resources and Ecosystem Conservation (Ministry of Environment and Forestry)

Executing Partner Type

Government

GEF Focal Area

Biodiversity

Taxonomy

Private Sector, Stakeholders, Focal Areas, Biodiversity, Mainstreaming, Agriculture and agrobiodiversity, Influencing models, Strengthen institutional capacity and decision-making, Individuals/Entrepreneurs, Civil Society, Community Based Organization, Gender Equality, Gender results areas, Gender Mainstreaming, Women groups, Capacity, Knowledge and Research, Capacity Development

Rio Markers**Climate Change Mitigation**

Climate Change Mitigation 0

Climate Change Adaptation

Climate Change Adaptation 0

Duration

60 In Months

Agency Fee(\$)

588,306

Submission Date

3/16/2020

A. Indicative Focal/Non-Focal Area Elements

Programming Directions	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
BD-1-4	GET	5,692,694	54,792,265
BD-3-9	GET	500,000	3,785,959
	Total Project Cost (\$)	6,192,694	58,578,224

B. Indicative Project description summary

Project Objective

To strengthen the conservation and sustainable use of globally significant crop diversity, in the wild and on-farm, originating in Indonesia, through sustainable practices and improved capacities, a strengthened enabling environment, and the development of long-term incentive mechanisms

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
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Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
1. Strengthen the enabling environment to promote the conservation and sustainable use of the plant genetic diversity of important endemic local crops and varieties	Technical Assistance	<p>1.1 National strategies/ policy developed to streamline the cross sectoral conservation and sustainable use of endemic PGRFA with focus on implementation of the Nagoya Protocol and other relevant instruments</p> <p>1.2 Conservation and sustainable use of plant genetic resources have been harmonized and mainstreamed into cross-sectoral and sectoral policies and planning</p> <p>1.3 Recommendations provided to provincial and district governments for policies promoting the conservation and sustainable use of endemic crop and varieties</p>	<p>1.1.1 National strategy or policy for conservation and sustainable use of the genetic diversity of important native local crops and varieties in line with relevant international instruments</p> <p>1.1.2 Gap analysis undertaken of ABS provisions in existing policies, laws and regulations, stakeholder identification, user rights and intellectual property rights, and assess institutional capacity including research organizations</p> <p>1.1.3 Capacity built among stakeholders (including local communities, especially women) to negotiate between providers and users of genetic resources.</p> <p>1.1.4 Strategy and action plan for the implementation of ABS measures. (e.g. policy, legal, and regulatory frameworks) governing ABS developed and implemented</p>	GET	980,576	4,485,002

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
2. Conservation and utilization of selected crops and their crop wild relatives species are ensured for sustainable agricultural development, food security and environmental stability	Investment	<p>2.1 Methodologies on <i>in situ</i>/on farm conservation and utilization of crops and wild species are available, disseminated and used.</p> <p>2.2 Capacities strengthened to support long-term plans and up-scaling of incentive-based approaches for the <i>in situ</i>/on-farm conservation and sustainable use of crop diversity for resilient agriculture and sustainable production</p> <p>2.3 Improving the linkages between <i>ex situ</i> and <i>in situ</i> conservation and on-farm management of PGRFA efforts</p>	<p>2.1.1 Mapping the locations of CWRs, characterization and evaluation for adaptive and agronomic traits, the assessments of threats and the development and implementation of conservation mechanisms;</p> <p>2.1.2 Use of existing methods and tools for documenting crop diversity and traditional knowledge;</p> <p>2.2.1 The application of the results of innovative research and training for the diverse stakeholders made available</p> <p>2.2.2. Links with extension services will be established and their capacity to support local enhanced through capacity building approaches, such as farmer field schools.</p> <p>2.2.3 Communities' capacity for conserving and using crop diversity and diversification <i>in situ</i> and on-farm is enhanced to ensure the sustainability of conservation and use initiatives.</p> <p>2.3.1 Effective management</p>	GET	3,268,587	48,712,253

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
3. Mainstreaming diversity of local varieties through biological, socio-cultural and economic evaluation and the development of market/non-market incentives and linkages in target sites	Technical Assistance	<p>3.1 Improved marketing of products made from local varieties, including through the use of both traditional knowledge and modern technologies, taking into account market /non-market initiatives to increase local crop diversity production and availability</p> <p>3.2 Harmonization of rules, protocols and guidelines between users and providers of plant genetic resources</p>	<p>3.1.1 Evaluation of local varieties through traditional knowledge, socio-cultural assessment and economic issues</p> <p>3.1.2 Development of on-farm conservation approaches and technologies to ensure long term, demand-driven conservation of local varieties</p> <p>3.1.3 Business and marketing plans developed in pilot communities to maximize opportunities for product development and revenue creation based on strengthening market linkages among breeders, small-scale farmers and local and provincial markets to mainstream local crop diversity.</p> <p>3.2.1 Clear procedures and protocols and guidelines issued for bioprospecting research and development, including IPR application</p>	GET	913,209	4,971,495

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
4. Strengthening knowledge management	Technical Assistance	<p>4.1 Information and knowledge of social, cultural, economic, research and marketing aspects related to crops and their local varieties will be collected, documented and disseminated for providing basic support for further conservation and sustainable utilization</p> <p>4.2 Education, public awareness and dissemination in support of promoting the conservation and sustainable use of crop diversity</p>	<p>4.1.1 Traditional and new knowledge, generated through participatory research for <i>in situ/on-farm</i> conservation and sustainable use of crop wild relatives and local varieties, documented together with best practices/ lessons learnt from pilot sites to applicability to other crops and varieties in Indonesia</p> <p>4.1.2 Establishing/ enhancing information and communication platforms (web-based information platform and inter-sector working groups), dedicated to <i>in situ/on-farm</i> conservation</p> <p>4.1.3 Databases of species, varieties, traditional research and development practices for conservation and sustainable use of local varieties created</p> <p>4.2.1 Creation of information materials for dissemination to the wider public</p> <p>4.2.2 Integration of crop diversity into the curricula of university, primary and secondary school modules</p>	GET	735,432	409,474

Project Component	Financing Type	Project Outcomes	Project Outputs	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
				Sub Total (\$)	5,897,804	58,578,224
Project Management Cost (PMC)						
				GET	294,890	
				Sub Total(\$)	294,890	0
				Total Project Cost(\$)	6,192,694	58,578,224

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	Ministry of Agriculture	In-kind	Recurrent expenditures	48,046,546
Government	Ministry of Environment and Forestry	In-kind	Recurrent expenditures	135,443
Government	Indonesian Science Institute	In-kind	Recurrent expenditures	17,829
Government	Local Government of Central Kalimantan	In-kind	Recurrent expenditures	14,257
GEF Agency	FAO	In-kind	Recurrent expenditures	550,000
Government	Local Government of North Maluku	In-kind	Recurrent expenditures	352,680
Government	Local Government of Central Java	In-kind	Recurrent expenditures	84,015
Donor Agency	IFAD	In-kind	Recurrent expenditures	9,178,571
CSO	Rikolto	In-kind	Recurrent expenditures	182,210
Private Sector	PT. Maxindo Karya Anugerah	Grant	Investment mobilized	16,673
			Total Project Cost(\$)	58,578,224

Describe how any "Investment Mobilized" was identified

The private sector involved is expected to mobilize funds as cofinance from its internal source.

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(\$)
FAO	GET	Indonesia	Biodiversity	BD STAR Allocation	6,192,694	588,306	6,781,000
Total GEF Resources(\$)					6,192,694	588,306	6,781,000

E. Project Preparation Grant (PPG)

PPG Required

PPG Amount (\$)

200,000

PPG Agency Fee (\$)

19,000

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)	Total(\$)
FAO	GET	Indonesia	Biodiversity	BD STAR Allocation	200,000	19,000	219,000
Total Project Costs(\$)					200,000	19,000	219,000

Core Indicators

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)
1300000.00	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)
1,300,000.00			

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

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)

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)

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

Title	Submitted			
	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	10,000			

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Male	10,000			
Total	20000	0	0	0

Part II. Project Justification

1a. Project Description

1) The Global Environmental and/or Adaptation Problems, Root Causes and Barriers

In situ conservation and sustainable use of plant genetic resources for food and agriculture (PGRFA) is necessary to ensure crop production and meet growing environmental challenges and climate change. The erosion of these resources poses a severe threat to the world's food security in the long term. Conservation of diversity, *in situ* (including on-farm) and *ex situ* is vital for increasing production sustainably and addressing nutritional requirements of present and future generations. However, crop specialization over the last 50 years has led to genetically uniform varieties, reducing the potential to adapt to changing environmental conditions.

There is an urgent need for concerted attention on *in situ* conservation and on-farm management of PGRFA, as a necessary complement to *ex situ* conservation activities. Fragmented conservation efforts threaten the availability of these resources, at a time when they are increasingly necessary for crop improvement and for ensuring the stability of, and diversity in, agro-ecosystems as adaptive mechanisms to climate change and other drivers of food insecurity and malnutrition. The conservation and sustainable use of improved crop diversity has the potential to:

- increase productivity, food and nutrition security, and economic returns;
- reduce pressure of agriculture on fragile areas, forests and endangered species;
- make farming systems more diverse, stable, robust, and sustainable;
- contribute to sound pest and disease management;
- conserve soil and increase natural soil fertility and health;
- contribute to sustainable intensification of farming systems.

The conservation of prevalent plant biodiversity in the region will ensure the availability of valuable genetic stocks for plant breeders and researchers. This will not only result in the survival and hence the protection of the natural resource base but also provide a solid basis for sustainable agriculture production in the region. The high diversity of cultivated plant species in the region is an international resource of global significance; an essential component of improved crop production in the region and constitutes a key element of farmer production strategies.

In situ conservation is concerned with the maintenance of species populations in the habitats in which they occur. Crop wild relatives, a gap in the conservation of species in the wild, are an essential reservoir of traits for crop improvement. Their continued survival in the wild allows evolutionary forces, such as climate change, to promote adaptation of these species *in situ*. However, these species are currently not inventoried nor their threat status assessed in protected areas. The project will aim to address this major need.

For agricultural crops, *in situ* conservation refers to the habitats where cultivated crops developed their present day properties, predominantly in farmer's fields. The role of farmer communities is central to the theme of *in situ*/on-farm conservation. Crop genetic resources in local cultivars (or landraces) are passed from generation to generation of farmers and are subject to different selection pressures including farmer's selection. Environmental, biological and socio-economic factors influence a farmer's decision on whether to select or maintain particular crop cultivars (or landraces) at any given time. Participation by local farming communities is a determining factor if an effective *in situ* conservation is to be achieved – this is a gap highlighted by the Government of Indonesia.

Locally developed traditional varieties have been shown to be essential components of crop production in productive and marginal environments. *In situ*/on farm conservation provides for continued production based on cultivars adapted to such environments and for their continued improvement in ways that directly meet farmer's needs. Sustainable development is the necessary focus, especially as this project will not only promote the conservation and sustainable use of the target species but will also promote the diversification of farming systems based on the target species. The outcome will be resilient agroecosystems, both environmentally and economically, to improve livelihoods of the smallholder farmers.

While a significant number of laws and legislation have been approved in the country, there is a need to improve the coordination between national, provincial and district level implementation of these regulations. There is also a clear need for harmonization of legislation across the sectors (forestry, agriculture, value chains) to promote cross sectoral delivery of conserving and sustainably using plant genetic resources. There is a gap in existing regulation especially on Nagoya Protocol implementation in non-forest areas. The project will strengthen institutions and systems needed to implement the Nagoya Protocol in these areas and also in forest areas. This is important for a country rich in biodiversity where the bioprospecting value of recorded endemic species is high since Indonesia is a mega-diverse country, with considerable untapped wealth based on its rich genetic resources and traditional knowledge. The project will focus on strengthening national regulatory frameworks and clarify institutional responsibilities and administrative mechanisms for ABS agreements and enhance understanding of the ABS regime.

There is a need to support national implementation of the Nagoya Protocol and targeted capacity building of the Protocol. The successful implementation of ABS at the national level, while currently lacking, has the potential to make considerable contributions to biodiversity conservation and sustainable use. Through this project, the following core activities will be supported to comply with the provisions of the Nagoya Protocol:

1. Stocktaking and assessment. The GEF supports gap analysis of ABS provisions in existing policies, laws and regulations, stakeholder identification, user rights and intellectual property rights, and assessments of institutional capacity including research organizations.

2. Development and implementation of a strategy and action plan for the implementation of ABS measures (e.g. policy, legal and regulatory frameworks governing ABS, National Focal Point, Competent National Authority, Institutional agreements, administrative procedures for Prior Informed Consent (PIC) and Mutually Agreed Terms (MAT), monitoring of use of genetic resources, compliance with legislation and cooperation on trans-boundary issues).
3. Development (or revision) of national measures to implement and enforce the Protocol (e.g. the legislative, administrative or policy measures on access and benefit-sharing).
4. Building capacity among stakeholders (including Indigenous and local communities, especially women) to negotiate between providers and users of genetic resources.

The use of Geographical Indication (GI) for diversifying and promoting agricultural production is has been accepted globally as a useful strategy in conserving crop diversity on-farm as well as improving livelihoods of the smallholder farmer. GIs are signs which identify a product as originating in a particular region or locality, where a given quality, reputation or other characteristic of the product is essentially attributable to its geographical origin. They are considered a useful tool for economic growth and sustainable development, particularly in rural areas. GIs help foster new markets by ensuring producers meet certain quality standards and promote the distinct product qualities attributable to their origin that consumers can easily identify. While this approach is acknowledged at the legislation level in Indonesia, activities for improving crop diversity and its marketing are still underfunded and not efficiently implemented. There is great potential for marketing the endemic varieties of the selected crop species at the national and global level to improve both their conservation and farmers' livelihoods.

The absence of coordinated and integrated approaches to sustainable use of natural resources and the weak communication among stakeholders have direct negative impacts on the environment and remains a barrier to the development of effective interventions to conserve and sustainably use natural resources. Increasingly, human influence on the environment represent a real threat for all biodiversity components, and, above all, for humanity itself.

Country context and global significance

Indonesia's geological history and topography supports its biological diversity and uniqueness. It is an archipelagic country located in the biodiversity distribution path of the Asian continent (Java, Sumatra and Kalimantan islands) and Australia (Papua), and in the transitional zone of the Wallace line (Sulawesi, Maluku and Nusa Tenggara islands), and therefore encompasses the biological richness of Asia, Australia and the transitional zone of the two continents. The geological history of each island in Indonesia gave rise to the climate variations, which is wet in the western part and drier in the eastern part, thus influencing the ecosystem formations and flora and fauna distribution.

Biodiversity forms, patterns and levels in the agro-ecosystems all over Indonesia have not been well documented. However, there are individual reports from various areas on the diversity of system, species and genetic resources in agroforestry and community agricultural systems. For example, the Dayak Pasir community in East Kalimantan plant 10-17 rice varieties simultaneously, while the Dayak community in the upstream area of Bahau river plants 58 local rice varieties. The agroforests in Maninjau, Sumatra usually have more than 300 plants, 30 of which are fruit species. The communities in West and Central Kalimantan developed the tembawang agroforest system, in which they plant fruit trees together with resin producing trees, timber, palm, liana, rattan and herbs in a single patch of land, adopting the forest like structure. One tembawang plot can harbor up to 45 fruit species.

Indonesia, as part of the 7A Vavilov Centre of Diversity covering the Siam-Malaya-Java region, is a centre of diversity for crops of major economic importance. A Vavilov Centre of Diversity is a region of the world that is a center for the domestication of plants, which is also accepted as a center of genetic diversity for those crop species. Indonesia is a centre of origin and/or diversity for some of the major crops in the world, with regard to both crop wild relatives (including wild rice, banana, mango, breadfruit, sugarcane, taro, coconut, sweet potato, melon, sorghum, citrus, and aubergine[1]¹) as well as locally adapted cultivars.

Among the diversity maintained within Indonesia, there are 10 592 accessions of 23 food crops, conserving rice, sweet potatoes, cassava, peanut, corn, peas, minor legumes and minor tuber crops. These collections are maintained the Department of Agriculture and consist of field collections as well as short/medium/long term seed collections. The Department of Agriculture also oversees the plantation plants (coconut, nutmeg, clover, oil palm, rubber, tea, cacao, coffee etc.), medicinal, aromatics, fruits, vegetables and ornamentals collections were in the form of field crops and seeds.

The Indonesia country report from *The Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture*[2]² highlighted the need for improved coordination among stakeholders in *in situ* management. There was also a need to promote the establishment of international, regional and national networks on *in situ* management and genetic improvement. The report also emphasized the need to continue surveying, collection and documenting of plant genetic resources, especially wild plant genetic resources and old landraces grown in remote areas.

To date, however, legal/regulatory frameworks in Indonesia related to biodiversity have mostly been related to ecosystems, and species-level treatment has rarely been related to genetic resources. The management of genetic resources has limited to breeding programmes, and to date has not involved farmers in the utilization or protection or crop genetic diversity.

The outcome of the project is improved *in situ* and on-farm conservation and sustainable use of globally important crop diversity in Indonesia, through improved conservation practices, a strengthened enabling environment, and the development and demonstration of long-term incentive mechanisms. The GEF-supported activities will be integrated into all of the components of the project and will include documenting local agrobiodiversity, including crop wild relatives, and assessing the values, threats and competitiveness of crops relevant to the rural poor, within a climate change context. It will enhance the capacities of stakeholders in documenting, monitoring, conserving and using crop diversity in the wild and the associated knowledge on-farm. Exploring relevant policy options and collaborative frameworks are therefore essential for strengthening pro-poor on-farm conservation as well as a major focus will be placed on developing value chains, and promoting employment and entrepreneurship for young women and men.

The project will promote the conservation and sustainable use of crop diversity for food security as:

- the region is rich with many native crops, resistant to abiotic and biotic stress and characterized with great intra- and inter-specific diversity;
- the rich diversity of wild species present in the region are threatened by overexploitation, overgrazing, drought and desertification; and the diversity of old local varieties by replacement with a few modern ones; and

· the development of *in situ*/on farm conservation and sustainable use of local horticulture varieties can support increased sustainable agricultural production and conservation of agricultural biodiversity.

Target crops

For each of the crops, there is a need to develop detailed information on the numbers of species, varieties and CWR in the country. Threat assessments are required to document the levels of existing diversity and to document their status in order to develop management plans for their effective conservation and sustainable use.

The five target crops to be addressed within the project are of global and national significance. These species, identified as priority crops by the Ministry of Agriculture, are also identified under the Vavilov centre of diversity 7A:

- i. **Rice** (*Oryza* spp.). The archipelago of Indonesia has a long history of rice production across a broad range of rice growing environments resulting in a diverse array of local Indonesian rice varieties. Although some have been incorporated into modern breeding programmes, the vastmajority of these landraces remain untapped. Wild rice (*Oryza rufipogon*) is also found in Indonesia and is important as it comprises many resistance genes.
- ii. **Taro** (*Colocasia esculenta*). Indonesia, as one of the centres of origin for taro, is the largest centre of taro diversity where have been 182 genotypes of taro identified. However, recent times have seen a decrease in the acreage of cultivation in many places, leading to a loss of traditional cultivars and genetic diversity. Natural populations of wild taro can be found today and are harvested for traditional uses; however, many of these have not been studied and conserved effectively.
- iii. **Yam** (*Dioscorea* spp.). Indonesia is rich is diversity of yam species (including *Dioscorea alata*; *Dioscorea esculenta*; *Dioscorea aculeate*; *Dioscorea hispida*; *Dioscorea bulbifera*; *Dioscorea pentaphylla*). With regard to sources of dietary nutrients, yam species rank as the world's fourth most important root and tuber crops after potatoes, cassava, and sweet potatoes. Wild-harvested yam species play a prime role in providing food for the local communities, particularly during times of droughts and/or between cropping seasons.
- iv. **Cloves** (*Syzygium aromaticum* syn. *Eugenia aromatic*). Cloves come from an evergreen tree, native to Indonesia, and are used as a spice in the form of its dried flower bud. As a culinary spice, cloves impart a strong aroma and pungent taste that have enhanced the human enjoyment of many foods in cuisines all over the world. The essential oil is also valued for its use in flavorings and perfumes and its important antiseptic, analgesic, anti-oxidant, food preservation/ anti-microbial and anesthetic medicinal properties. The clove tree is in the Myrtle family *Myrtaceae*, and is believed to be native to the Maluku Islands, including North Maluku (Moluccas), an archipelago in Indonesia historically known as the "Spice Islands." Clove is often intercropped with nutmeg, coconut palm, areca nut palm, betel leaf, durian, and banana. In northern Maluku, cloves are scattered in several islands: Ternate, Tidore, Halmahera, Makian, Motir, Bacan etc.
- v. **Nutmeg** (*Myristica fragrans*). The nutmeg is unique among tree spices as it is the source of two distinct spices, nutmeg and mace. Nutmeg is the seed kernel inside the fruit and mace is the covering (aril) on the kernel. It is native to Indonesia (Moluccas Islands including North Maluku). Molecular characterization of nutmeg germplasm has shown high levels of diversity among different accessions and has highlighted the importance of the conservation and management of these important resources.

Site Selection

These candidate sites are across Indonesia and represent most climates, topographies, economics and cultures, and are threatened. FAO and IAARD collaborated on selecting three candidate provinces according to the following initial criteria

- The extent to which the area is only relevant to biodiversity management, as opposed to being a general environment concern.
- The extent to which the links between the area and site-level biodiversity conservation can be clearly established.
- The extent to which the status of *in situ* conservation in each site can be fully defined and fully addressed within the lifetime of the project.
- The extent to which the status of *in situ* conservation in each site is suitable for being addressed through international co-operation, supported by GEF.
- The extent to which each *in situ* conservation site can be monitored, and its impact on biodiversity can be monitored.
- The extent to which *in situ* conservation in each site falls in line with national priorities and national plans.
- The extent to which *in situ* conservation in each site is related to the transition to a market-oriented economy in Indonesia.
- The extent to which *in situ* conservation in each site will be sustainable, and sustainably used to support biodiversity conservation.
- The extent of urgency for *in situ* conservation in each site.

Target sites have been selected for their diverse landscapes and are representative of the three ecoregions of Indonesia. The Maluku Islands (or Moluccas) are geologically among the most complex of the Indonesian islands, consisted of four different tectonic plates. This abrupt relief pattern from sea to high mountains means that there are very few level coastal plains. By contrast, Kalimantan (previously known as Borneo) is the third largest island in the world and the native vegetation was mostly lowland rain forests although with montane rain forests inland. Java, however, is one of the most densely populated islands in the world. There are still a few montane rainforests as well as dryer, semi-evergreen rain forest, which differ from evergreen rain forest by being slightly more seasonal, with two to four dry months each year.

The selected sites are:

Central Kalimantan (Lamandau, Seruyan and Kapuas Districts). Central Kalimantan was selected because of its diverse agroecosystem coverage, such as tidal land in Kapuas District, and dry land in Lamandau and Seruyan Districts. In general, the sustainability of agricultural plant genetic resources management in this region is threatened by decreasing number of households working in the agricultural sector, and indication of decreasing in diversity of local rice varieties (unpublished data, 2013-2019). Many agricultural genetic resources have not yet been explored and conserved in this region, especially tuber genetic resources. Central Kalimantan Province covers an area of 15,392,577 ha, with an appropriate area for the development of agriculture and livestock sectors covering an area of 10,260,603 ha. The existence of wild relatives of rice and tubers in Central Kalimantan has not been identified to date. Therefore, besides rice and local tubers, the project is expected to map wild relatives of tubers as a source of genetic

diversity. At the provincial level, there is protection afforded to biodiversity through the Governor's Regulation of Central Kalimantan 41/2014, which addresses the areas of high conservation value and translates the national level legislation to the provincial level.

Coordinates:

1. Kapuas District: 0°8'48" - 3°27'00" South Latitude and 112°2'36" - 114°44'00" East Longitude

2. Seruyan District: 0°77' - 3°56' South Latitude and 111°49' - 112°84' East Longitude

3. Lamandau District: 1°9' - 3°36' South Latitude and 110°25' - 112°50' East Longitude

(ii) **Central Java (Klaten, Blora, Magelang Districts).** Klaten, Blora and Magelang Districts were selected as a project target sites due to its high range of altitude from leading to a significant level of diversity. Klaten District is the area of rice cultivation with 33,066 ha with harvest of 73,964 ha and yields of 5,141 tons/ha. Klaten was once a major source of tuber local diversity, which was adversely affected when improved rice, corn and soybean were promoted in agricultural programmes. However, the local rices as well as local tubers are still maintained on-farm by farmers due to their tolerance to biotic and abiotic stresses. Blora District with an administrative area of 1820.59 km² (182058.797 ha) has an altitude of 96.00-280 m above sea level. The largest use of its area is as a forest which includes state forest and community forest, which is 49.66%, 25.38% of paddy land and the rest is used as yards, fields, reservoirs, community plantations and others -that is 24.96% of all land uses. Rice is the main product for food crops. Tuber crops were planted in the dryland and forest areas. The total area of Magelang District is around 108,573 Ha, which about 36.892 ha is the area for rice cultivation, and about 49.518 ha is agriculture area for other commodities. Magelang district is included to this project as this district has *ex situ* collection.

Coordinates:

1. Blora District: 111°016' - 111°338' East Longitude and between 6°528' - 7°248' South Longitude

2. Magelang District: 110°12'30" - 110°12'52" East Longitude and 7°26'28" - 7°30'9" South Longitude

3. Klaten District: 110°30'-110°45' East Longitude dan 7°30'-7°45' South Longitude

(iii) **North Maluku (Tidore and Bacan Islands).** Tidore was selected as it is a centre of origin and diversity for nutmeg and cloves, which are still the prime commodities cultivated by the majority of local communities. The types of nutmeg that are currently in process of local varieties registration are the *Tidore*, *Ternate*, *Makean*, *Patani* and *Tobelo* Nutmegs. As the infrastructure for agricultural production is underdeveloped, the price of basic commodities, including rice, is increasing as is the demand for rice. Bacan Island has clove and nutmeg *ex situ* collection.

Coordinates:

1. Tidore Island: 0°-20°North Latitude until 0°-50°South Latitude and on 127°10-127°45' East Longitude

2. Bacan Island: 0°40'0"South Latitude and 127°30'0"East Longitude

2) Baseline scenario and any associated baseline projects

The project will build upon current government commitments to biodiversity and agrobiodiversity strategies and commitments, including the below legislations at the national level:

Institutional arrangement relevant to Nagoya Protocol and Genetic Resources conservation in Indonesia

A National Committee for National Genetic Resources exists, supported by the Regional Commission (Komda) at the provincial level. Currently, there are 29 Regional Commission throughout Indonesia. The National Committee has members from various ministries / institutions and Expert Teams who have the main duties and functions of:

- Provide advice and consideration to the Minister of Agriculture in policy making and decision making on SDGs for national agricultural development
- Establish cooperation and carry out coordination with related parties in the field of research and development, policies, and arrangements for the preservation and sustainable use of SDGs
- Conduct public awareness about the importance of conservation and utilization of genetic resources
- Conduct an analysis of public developments on the importance of SDG conservation and utilization

b) Development of regulations, institutions and public participation in various groups, especially at the regional level that supports the preservation and use of agricultural SDGs.

Existing Legislation and Regulations

- Law of the Republic of Indonesia Number 20 of 2016 on Marks and Geographical Indications, which means any indication which identifies goods and/or a product as originating from a particular region of which its geographical environment factors including nature, labor, or combination of both factors are attributable to a given reputation, quality, and characteristics of the produced goods and/or product.
- Elucidation of Law of the Republic of Indonesia Number 20 of 2016 on Marks and Geographical Indications. According to point 7, Article 1 of the Law, Right on Geographical Indications means the exclusive right granted by the State to the owner(s) of registered Geographical Indications, provided that its reputation, quality and characteristics of which serve as the ground for granting protection of Geographical Indications.
- Law No. 5 of 1990 concerning Conservation of Biological Resources and their Ecosystems.
- Law No. 5 of 1994 concerning the Ratification of the Convention on Biological Diversity (CBD)

- Law No. 4 of 2006 concerning the Ratification of International Treaty on Plant Genetic Resources for Plant and Agriculture, specifically: Article 5.1d: Promote *in situ* conservation of wild crop relatives and wild plants for food production, including in protected areas, by supporting, inter alia, the efforts of indigenous and local communities; Article 6 - Sustainable Use of Plant Genetic Resources.
- Law No. 11 concerning Ratification of the Nagoya Protocol: Number P.2/2018 addresses access to species' genetic resources and benefit sharing for its utilization.
- Law 12/1992 on agricultural production practices.
- Law 13/2010 on horticultural production.
- Law 23/2014 concerning local governance, which addresses the conservation and sustainable use of genetic resources at the local level.
- Law 29/2000 on plant variety protection.
- Law 39/2014 on cultivation of plantations.
- Law No. 41 of 1999 concerning forest protection and nature conservation.

Planning

- Indonesian Biodiversity Strategy Action Plan (IBSAP)
- National Commission on Genetic Resources under the Ministerial Decree No 734/Kpts/OT.12/12/2006 and Three Regional Commission on Genetic Resources under Governors Decrees.

Baseline Investments

The Ministry of National Development Planning (BAPPENAS) has, as one of its key performance indicator's, the promotion of agricultural of diversification, linking directly to Sustainable Development Goal 2. A major gap, which should be addressed, is the need for mainstreaming endemic crops for livelihood improvement.

Accordingly, the Ministry of Agriculture, through Indonesian Agency of Agricultural Research and Development (IAARD), is focusing on:

- producing and developing technological innovations and policy recommendations in the agricultural sector in supporting the realization of the industrial agriculture system
- improving the quality of agricultural research resources as well as the efficiency and effectiveness of their uses
- developing national and international networks for science and technologies, and improving the role of IAARD in agricultural development.

In collaboration with partners, IAARD is developing programmes on:

- increasing production and added value of horticulture

- increasing production on sustainable estate commodities
- increasing community food security and diversification.

Further investments include Indonesian Centre for Agricultural Biotechnologies and Genetic Resources Research and Development (ICABIOGRAD), who undertake conservation and management of agricultural genetic resources. The Indonesia Centre for Rice Research (ICRR) is conducting research and development on rice; including local rice. The Indonesian Legume and Tuber Research Institute (ILETRI) is doing research on various nuts and tuber. Taro and yam are commodities in this proposal that under ILETRI's focus. Under IAARD, there are several research institutes focus specifically on the selected crops, such as Indonesian Spice and Medicinal Crops (ISMERI). There are National and Regional Commissions on Genetic Resources and Assessment at Institute for Agricultural Technology at the regional level that will assist the project in initial data collection. The institutions need to be further strengthened in terms of *in situ* conservation and implementing regulations related to conservation.

In line with the recommendations from BAPPENAS, the Ministry of Environment and Forestry, through the Directorate of Biodiversity Conservation, undertakes surveys of wild plant species in protected areas, but not all conservation areas. The Directorate also oversees the implementation of the Nagoya Protocol as well as establishing the financial strategy for the access and benefit sharing mechanisms of wild species.

Livelihood improvement of smallholder farmers is a key focus area for the Ministry of Villages. The Ministry has set up a Village Fund to be used for promoting rural welfare. The focus is on promoting small-scale enterprises to empower the smallholders to develop rural and artisanal initiatives. A major area of collaboration is increasing the access of quality seeds and planting materials to farmers.

An IFAD-funded initiative, Integrated Village Economic Transformation (TEKAD 2), undertaken in collaboration with the Ministry of Villages, will be begin implementation next year in Maluku and North Maluku. The initiative includes one of the target crops, nutmeg, therefore there is significant potential for a synergized impact, while avoiding duplication. TEKAD support is conceived as an accelerator of village economic development in underprivileged areas of Indonesia – a temporary intervention that aims at boosting the capacities of existing players, in the villages and in their environment, so they can build on economic opportunities and leverage village resources to generate growth at village level. The programme strategy and activities are therefore driven by the primary concern that, by the end of project implementation, sustainable mechanisms have been established to ensure sustainable planning and implementation of village resources for economic growth. Therefore, the two projects, i.e. the GEF initiative and TEKAD 2, do not overlap but will develop a coherent way forward for sustainable livelihoods.

The International Treaty on Plant Genetic Resources for Food and Agriculture covers the main target crops of the project under its Annex 1. The Benefit Sharing Fund supports the activities of the Treaty through grants allocated to stakeholders for the conservation and sustainable use of crops. **Specifically, a proposal will be financed by the Access and Benefit Sharing Fund focuses on the conservation and sustainable utilization of the underutilized taro. The initiative aims to increase food security and improve livelihood of marginalized communities faced with climate change in Malaysia, Indonesia, Philippines and Fiji. The project is being proposed by Malaysia Agriculture Research and Development Institute (MARDI) and it is expected that implementation will commence once financing is secured**

The contribution of Non-Governmental Organizations is significant especially with regard to capacity building of farmers for GAPs. Rikolto (formerly VECO/Vredeseilanden) is an international NGO with its international office, headquartered in Leuven, Belgium, is working on sustainable rice production in Central Java. The work contributes to the Sustainable Rice Platform – this project will liaise with Rikolto to identify gaps in sustainable production of traditional rice to allow for a more effective investment of GEF finances. Likewise, the Kehati Indonesian Biodiversity Trust Fund is working on sustainable production of rice but not in this project's target areas. Thus, the project will liaise with Kehati to assess best practices and lessons learnt on the ground.

The private sector engagement is already partly ongoing through the work on breeding disease-resistant taro, obtained from the Ministry of Agriculture, and provided to PT. Maxindo Karya Anugerah for marketing. The Mekarsari Fruit Garden is, by contrast, working on the *ex situ* conservation and breeding of Musa and breadfruit. Training is also provided to farmers for GAPs, including propagation and value addition. These approaches will be used for the selected species in this project.

Indonesia was a part of the regional UNEP-GEF Project on the Nagoya Protocol ID 3853 “*Building Capacity for Regionally Harmonized National Processes for Implementing CBD Provisions on Access to Genetic Resources and Sharing of Benefits*” Project [1]. This project assisted participating countries to implement ABS by providing the opportunity for them to complete a national policy and regulatory regime, make further progress in developing draft national ABS laws and regulations, or to develop, or build the foundation for developing, a draft national ABS framework. The final evaluation of this project reported that the project achieved its objective of increasing understanding and capacity to a lesser degree – stakeholders' participation in the project enhanced their motivation to participate in implementing ABS more than it was able to build their capacity to do so. The Project focused on disseminating existing tools for implementing ABS, making them available and explaining them to all participating countries and sharing of lessons between participating countries. The Project was found to have been more effective in motivating stakeholders to participate in implementing ABS [2].

[1] <https://www.thegef.org/project/building-capacity-regionally-harmonized-national-processes-implementing-cbd-provisions>

[2] https://wedocs.unep.org/bitstream/handle/20.500.11822/22411/2820_3853_4415_3801_3855_2017_environment_gef_abs%20portfolio_Evaluation%20Synthesis%20Report.pdf?sequence=1&isAllowed=y

Linkages, synergies and collaborative delivery will also be undertaken with the recently approved GEF initiative, *strengthening sustainability in commodity and food-crop value chains, land restoration and land use governance through integrated landscape management for multiple benefits in Indonesia* (FOLUR). The areas targeted by the respective projects do not overlap, further extending the synergies between the two projects. Further, FOLUR interventions are backed by jurisdictional approaches to ensure restoration of degraded priority landscapes to maintain ecosystem services. The focus of this current GEF initiative is, by comparison, on the conservation and sustainable use of landraces and wild relatives of five species. Thus, there are synergies but no overlap between the two GEF initiatives in Indonesia.

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

Indonesia is rich in biodiversity especially for the wild species of crops such as rice and yams. As mentioned before, wild relatives of rice, yam and taro in Indonesia are also significant for world sustainable development. Further, the important economic crops, nutmeg and clove originate in Indonesia and require the assessment and mainstreaming essential for their continued survival in cultivation and in the wild.

However, with the development of rural economy, the diversity of crop wild relatives is declining. The wild relatives are now only found at a small number of geographically dispersed sites, and these sites are threatened by various factors. Many areas are threatened by conversion (to forestry, agriculture and pisciculture), grazing by farm animals, tourism, desertification, encroaching sand, construction and pollution.

Genetic erosion of PGRFA has not been systematically documented. However, in general it can be said that such erosion occurs at alarming rates. The Green Revolution, launched in Indonesia since 1969, especially on islands that applied the Panca Usaha Tani (Five Agriculture Tenets), has led to erosion in local rice varieties. In the early 1990s, some 70% of 8- 9 million hectares of wet rice fields are planted with one rice variety, the IR64, in a monoculture system. The uniform phenotype and genotype of rice plant weakens genetic viability towards new pests and diseases. This became evident when leaf blight disease, tungro virus and brown hopper infected rice fields in 1998-1999 and destroyed fields planted with IR64. In addition to pests, the use of high yielding varieties in a monoculture system also replaced local varieties, thus narrowing the genetic base of agricultural crops, not just rice.

By focusing on conservation and sustainable use of the five target species, an integrated approach will be formulated. This will provide a model for a national strategy for conservation of crop wild relatives and farmers' varieties. Nationally, there is commitment to conserving biodiversity overall. However, the resources (technical and financial) are often lacking. Furthermore, various sectoral policies related to biodiversity (forestry, agriculture, marine, and environment) are inadequate and some are overlapping, or even contradictory. GEF support can provide resources and translate national commitment into action. GEF can also leverage significant national support to conserving crop wild relatives and farmers' varieties.

The project will address incentives for conserving and using crop diversity to ensure "triple wins" with regard to social, economic and environmental benefits as follow:

- a) ABS schemes promoted through the development of licensing systems to allow external parties to utilize crop diversity and diversification effectively;
- b) Promote the marketing of crop diversity at the community level through geographical indication schemes and promotional activities, such as e-marketing. The outcome will be the improved livelihoods of communities and increased awareness of the benefits of conserving and sustainably using existing crop diversity at the local level.

- c) In order for the above to ensue, it is necessary to formulate an incentive system with government support to ensure the triple win principle. It is foreseen that the government facilitate the collaboration between local communities and third parties (such as the private sector).

The project will have **four key components** to achieve this Objective, which are described below.

Component 1. Strengthen the enabling environment to promote the conservation and sustainable use of endemic crop diversity

The objective of this Component is to strengthen cross sectoral, enabling environments to promote mainstreaming of conservation and sustainable use of the plant genetic diversity of important native local crops and varieties. Three Outcomes are envisaged under this Component. Under the first Outcome “National strategies/ policy developed to streamline the cross sectoral conservation and sustainable use of endemic PGRFA” the project will support the assessment of existing national policies for coherence, including harmonizing incentives and disincentives for promoting sustainable agricultural and natural resources practices across the Ministries of Agriculture, Environment and Forestry and provincial policies. The outputs (1.1.1 and 1.1.2) will identify and inform actions to mainstream plant genetic diversity conservation and use into appropriate national and sub-national policies – including any land use/ land management policies or plans (such as protected areas/ watershed management plans), particularly relevant to crop wild relatives

Output 1.1.3 will also support streamlining national strategies/ policies and multi-sectoral action plans, such as in agriculture and forestry to create an enabling environment for the conservation and sustainable use of native and other important PGRFA. The action plan will support development of mechanisms to ensure coordination between different relevant initiatives across Indonesia. Under this Outcome, the focus will be on ensuring harmonization of the mechanisms for Access and Benefit Sharing (ABS) as mandated under the Nagoya Protocol at the national and appropriate sub-national levels.

The second Outcome under this Component will include “Conservation and sustainable use of plant genetic resources have been harmonized and mainstreamed into cross-sectoral and sectoral policies and planning”. Whilst the first Outcome focuses on overall national cross-sectoral strategy and capacity building, under this second Outcome will strengthen mainstreaming of conservation and sustainable use of plant genetic resources (including crop wild relatives) in key sectors – agriculture and environment, as well cross-sectoral in terms of provincial commissions. The project will support analysis of existing policies on plant genetic resources to be assessed for coherence (Output 1.2.1), including harmonizing policies across the Ministries of Agriculture, Environment and Forestry and provincial policies. This component will also support national implementation of the Nagoya Protocol and targeted capacity building to implement of the Protocol. The project will focus on the implementation of the Nagoya Protocol, and address element of Articles 4, 6, 7 and 9. Detailed mapping of activities will be undertaken during the following PPG phase.

Under Outcome 1.3 “Recommendations provided to provincial and district governments for policies promoting the conservation and sustainable use of endemic crop diversity” the project will focus on the preparation of three provincial strategies/policies and with district-level plans in alignment with the crop-specific action plans (Output 2.3.1) as outlined in FAO’s Guidelines for Developing a National Strategy for Plant Genetic Resources for Food and Agriculture³. The strategies will detail the key elements of a

PGRFA strategy, including periodic inventorying, monitoring and threat assessments; regular stakeholder engagement; improvement of the material (e.g., through seed cleaning, participatory plant breeding); areas for value chain interventions; and, improving access to genetic diversity.

Component 2. Conservation and utilization of selected crops and their crop wild relatives species are ensured for sustainable agricultural development, food security and environmental stability.

This component addresses the need to increase capacity and raise awareness seminars to provide information on the role of agricultural biodiversity and its importance in conservation/preservation of livelihoods. GEF support will address significant knowledge gaps and document crop diversity as many of the crops and varieties conserved on-farm and in the wild lack detailed data on diversity and use.

The project will focus on strengthening community-based, regional and national conservation initiatives to reinforce broad participation of those most affected by such conservation and management interventions is required for success. This will involve the application of the results of innovative research and training for the diverse stakeholders to allow improved technologies as well as traditional methods to be applied successfully. However, efficient knowledge transfer is necessary for effective capacity building to support long-term plans and upscaling of incentive-based approaches for the *in situ*/on-farm conservation and sustainable use of crop diversity (as described in Component 3). In order to promote resilience, the project will build capacity for improved use of crop diversity and in diversified farming systems, including agroforestry. Links with extension services will be strengthened and knowledge bases supported using diverse strategies, such as training of trainers and farmer field schools.

Three Outcomes planned under this Component. The first Outcome will be “2.1 Methodologies on *in situ*/on farm conservation and utilization of crops and wild species are available, disseminated and used.” Under this Outcome, actions will focus on the *in situ*/on-farm conservation and utilization of selected crops and their crop wild relatives. This requires that methodologies on *in situ*/on farm conservation and utilization of crops and wild species are available, disseminated and used. GEF support will be crucial to understand and identify germplasm is present in the wild and on farms. Output 2.1.1. will, therefore, map the locations of landraces CWRs, characterization and evaluation for adaptive and agronomic traits, the assessments of threats and the development and implementation of conservation mechanisms. This will support identification and characterization of priority ecosystem/habitats within and outside of the protected areas that are important for PGR, including CWR.

The CWR of the selected crop species will be conserved *in situ* in the target sites, managed by the Ministry of Environment. The management plans will be species-specific, and will be developed as per FAO’s *Voluntary Guidelines for the Conservation and Sustainable Use of Crop Wild Relatives and Wild Food Plants*(4)⁴. The sustainability of a management plan involves the consensus a wide range of stakeholders with local communities and authorities in agreement to ensure their interests and concerns are reflected.

Genetic erosion of crop diversity *in situ* and on-farm is occurring rapidly, requiring the safeguarding of germplasm in genebanks. Activities will promote *in situ* – *ex situ* linkages in effective conservation of the selected species as they are found in existing protected areas, but they are not being actively monitored and managed. The work undertaken within

the context of the project will actively conserve germplasm of the selected species *in situ* in the wild/field while population samples will be conserved in national genebanks/field genebanks. *Ex situ* conservation plays a vital role in facilitating access to CWR accessions for obtaining baseline morphological and molecular data. The establishment and implementation of *ex situ* conservation priorities includes three steps: (i) review of *ex situ* conservation gaps, (ii) selection of CWR and sites for targeted collecting, (iii) gene bank seed processing, and (iv) post-storage seed care

Under Outcome “2.2 Capacities strengthened to support long-term plans and up-scaling of incentive-based approaches for the *in situ*/on-farm conservation and sustainable use of crop diversity, the project will support capacity building of government’s agriculture extension service, as well as natural resources management staff related to protected areas and forestry/ wetland management so that they can support plant genetic resources conservation through farmers and local communities. The project will also support communities’ capacity for conserving and using crop diversity and diversification *in situ* and on-farm is enhanced to ensure the sustainability of conservation and use initiatives. Furthermore, the project will also build capacity built among other stakeholders (especially women, the private sector, school children) to promote understand of providers and users of genetic resources.

In order to realize sustainable use of landraces, it is necessary to characterize and evaluate endemic diversity of the target species in the project sites. Activities will follow those outlined in FAO’s Voluntary Guidelines for the Conservation and Sustainable Use of Farmers’ Varieties/Landraces⁵. GEF resources will promote capacity building in plant breeding as well as for seed/roots/sapling production. Activities will, inter alia, assess: agromorphological traits used by farmers to identify, or distinguish, varieties; which of these traits are preferred, farmer selection approaches to maintain these desirable characteristics and to increase the prevalence of other valued traits in the population over time. It is foreseen that on-farm trials, regeneration methodologies and demonstration plots will be used to illustrate crop characteristics.

Under Outcome 2.3 “Improving the linkages between *ex situ* and *in situ* conservation and on-farm management of PGRFA effort”, the project will address a key knowledge gap in effective conservation, which is the clear linkages between the conservation and evaluation of germplasm *ex situ* (in genebanks) and *in situ* in the field. The *ex situ* conservation activities will be undertaken and financed by the Indonesian government agencies but there is a clear need for increased coherence with the germplasm conserved *in situ*. GEF resources will be instrumental in ensuring germplasm availability *in situ* for use by future generations through the combination of evolution that happens between the crop, the environment and the human selection component. These GEF-supported activities will also ensure the conservation of less well-collected species such as many crop wild relatives and large numbers of neglected and underutilized species with little or no representation in *ex situ* collections

Component 3. Mainstreaming diversity of local varieties through biological, socio-cultural and economic evaluation

Two Outcomes are planned under this Component. The first Outcome “3.1 Improved marketing of products made from local varieties, including through the use of both traditional knowledge and modern technologies, taking into account market /non-market initiatives to increase local crop diversity production and availability” will address the improved marketing of products made from crop wild relatives and local varieties, including through the use of both traditional knowledge and modern technologies. This will take into account market/non-market initiatives to increase local crop diversity production and availability. Evaluation of local varieties and crop wild relatives will be undertaken

through traditional knowledge, socio-cultural assessment and economic issues as a first step to developing effective management and policy strategies. Information on local, national, and international policy on seed systems affecting the study sites will be compiled and analysed. Weak links in the farmers' seed systems will be identified from the aforementioned analyses. Government, NGO, agricultural extension, and seed industry officials will be consulted as to their current and possible future roles in supporting farmers' seed systems. Local capacity building will focus on ameliorating the weaknesses identified in the seed systems by supplying relevant information to the appropriate audiences. Community level meetings and other methods of knowledge exchange will be employed to strengthen local capacity for value chain interventions. Strategies to strengthen value chains for smallholder farmers include: (i) providing education and training in developing value chains; (ii) strengthening weaknesses identified from the evaluations undertaken and promote to support mainstreaming crop diversity (e.g. third party monitoring, quality verification systems, geographical indication, farmer accreditation schemes and other farmer incentive mechanisms); (iii) encouraging the participation of farmer associations or cooperatives to provide a critical mass in terms of supply and provide a conduit for the dissemination of information on the management of crop diversity to smallholder farmers.

Under Outcome "3.2 Harmonization of rules, protocols and guidelines between users and providers of plant genetic resource", the project will support mainstreaming of a diversity of local varieties will require a cross sectoral approach, promoting biological, socio-cultural and economic evaluation and the assessment of market/non-market initiatives

For the piloting of PPPs in target districts, the project will work together with the identified private sector companies and local government to implement the sustainable production models, including contributing to the establishment of local agribusiness institutions, such as cooperatives (Koperasi). Output 3.1.3 will promote the development of business and marketing plans developed in pilot communities to mainstream local crop diversity, including establishing Koperasi, and increased linkages with private companies for value addition initiatives. This will promote the development of on-farm conservation approaches and technologies to ensure long term, demand-driven conservation of local varieties

The project will help to develop clear procedures and protocols and guidelines are required for bioprospecting research and development. The amount, duration, beneficiaries, all depend on access to genetic resources need to be determined with regard to the target species. The agreements will be useful for applying these agreements to other species and areas of the country. This component will benefit from improved policy and institutional frameworks created through Component 1 and capacity built for participatory agricultural research and extension services through Component 2.

Component 4. Strengthening knowledge management

The final project component will be strengthen knowledge management platforms and improve awareness through education and dissemination of information materials. The main objective of this component is that information and knowledge of social, cultural, economic, research and marketing related to the target crops and their local varieties will be collected, documented and disseminated. Two Outcomes are planned under this component.

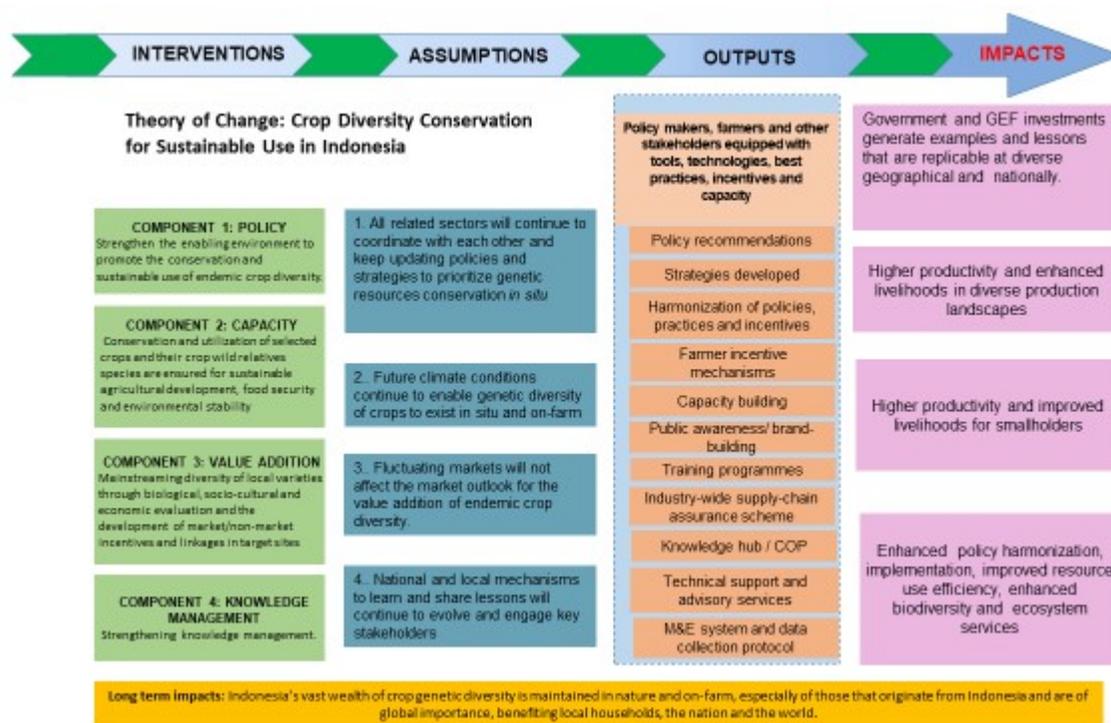
Outcomes 4.1 and 4.2 entail the provision of basic support for further conservation and sustainable utilization and strengthened education, public awareness and dissemination in support of promoting the conservation and sustainable use of crop diversity. Outcome 4.1 will promote the documentation and access of information, essential for the sustainability of the results of the project. Traditional and new knowledge, generated through ethical, participatory research for *in situ*/on-farm conservation and sustainable use of crop wild relatives and local varieties will be documented. Information and communication platforms, both web-based and inter-sectoral working groups, will be established and existing ones further developed to avoid duplication. Databases of species, varieties, traditional research and development practices for conservation and sustainable use of local varieties will be created. Furthermore, the application of the results of innovative research and training for the diverse stakeholders of the genetic diversity managed by the community will be made available.

Traditional and new knowledge, generated through participatory research for *in situ*/on-farm conservation and sustainable use of crop wild relatives and local varieties, will be documented together with best practices/lessons learnt from pilot sites. The approaches used will be applicable to for the conservation and sustainable use of other crops and varieties in Indonesia. This component will, therefore, establish/enhance information and communication platforms (e.g. web-based information platform and inter-sector working groups), dedicated to *in situ*/on-farm conservation. On the ground, the work will focus on the creation of information materials for dissemination to the wider public. Linked to this is the integration of crop diversity into the curricula of university, primary and secondary school modules and/or courses.

This component will focus on improving data and information systems on the conservation and sustainable use of the five selected species, their management dissemination of best practices. It will involve integrating data and information using a user-friendly system. In addition, the component will develop knowledge products (such as videos, photo stories, flyers, brochures) on all thematic areas and targeting knowledge gaps identified in the above components. It will also capture best practices of the project and disseminate through various media including training modules and educational curricula.

Theory of Change

The proposed initiative's theory of change entails an integrated approach with transparent impact pathway between the full ranges of stakeholders to create a shared vision of the desirable future condition of the landscape (See below). The project also articulates a theory of change that demonstrates a clear causal link between project activities and concrete benefits.



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

The project is strongly aligned to the GEF-7 strategy related to *in situ* conservation and sustainable use of genetic resources under Objective 1: biodiversity mainstreaming across priority sectors. The project's results will contribute directly to *GEF7 BD-1-4 Mainstream biodiversity across sectors as well as landscapes and seascapes through Sustainable Use of Plant and Animal Genetic Resources*. In line with the GEF-7 strategy, the project will support farmer led *in situ* conservation and sustainable use, through farmer management, of plant genetic resources in Vavilov Centers of Diversity. As mentioned above, Indonesia is a Vavilov centre of diversity and the high levels of diversity of the five target crops testify to this. The project will promote the on-farm conservation and use of crop diversity to allow continuing evolution and adaptation of cultivated plants and domesticated animals while meeting the needs of rural communities and "adat" (native) communities.

In addition, the project will also strengthen the implementation of the Nagoya Protocol in the country, and hence will be strongly aligned with the *GEF-7 Objective 3-9 Further development of biodiversity policy and institutional frameworks through the Implementation of the Nagoya Protocol on Access and benefit sharing* – especially implementation of

Nagoya Protocol on access and benefit sharing. As outlined in the GEF7 strategy, this project will support stocktaking and assessment. GEF resources will support: a) gap analysis of ABS provisions in existing policies, laws and regulations, stakeholder identification, user rights and intellectual property rights, and assess institutional capacity including research organizations; b) development and implementation of a strategy and action plan for the implementation of ABS measures; and c) building capacity among stakeholders (including indigenous peoples and local communities, especially women) to negotiate between providers and users of genetic resources

The activities of the project are also relevant to Pillar I of the CBD's guidance for the GEF-7, for which the harnessing of biodiversity for sustainable agriculture is mentioned specifically. The Strategy highlights the need for the protection for crop wild relatives (CWR) *in situ* through the establishment of CWR reserves. The project will address this through activities such as mapping the locations of CWRs, threat assessments and the implementation of conservation mechanisms.

The project also aims to strengthen policy and regulatory framework under Component 1 to ensure sustainability and replicability of project's approaches and lessons. The activities under Component 1 fall within Objective 3: Further develop biodiversity policy and institutional frameworks, specifically on **implementing the Nagoya Protocol on Access and Benefit Sharing**. The work will and provide the basis for strengthening national and provincial level ABS policies, including benefit-sharing arrangements between users and providers of genetic resources. It will foster local research capacity on crop genetic resources create conditions that facilitate the conservation of globally important crop species and for advancing new development models in the country that optimize the fair and equitable sharing of benefits derived from its comparative advantage as a biodiversity-rich country.

At the highest level, the project will contribute to the 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs), in particular SDG 2 on Zero Hunger and SDG 15 Life on Land. The project will also promote the development of mechanisms for the implementation of the Nagoya Protocol. Through this activity, the project will address pillar III of CBD's guidance for the GEF-7, which requires the further development of biodiversity policy and institutional frameworks.

5) Incremental/additional cost reasoning and expected contributions from the baseline, the GEF7, LDCF, SCCF, and co-financing

Under the baseline scenario, loss of genetic diversity of key agricultural crops and their wild relatives in Indonesia will continue through limited knowledge on their importance, and limited capacities and incentives to farmers and other stakeholders to utilize them for immediate benefits. Absence of a national strategy that is also "owned" by different sectoral Ministries, sub-national governments, farmers and private sector will hamper efforts to have a mainstreamed approach to *in situ* conservation of plant genetic resources, including crop wild relatives. The government's commitment to implement the Nagoya Protocol nationwide will not be achieved at the scale and speed that is required.

GEF investment will build on national commitments to *in situ* conservation and sustainable use of plant genetic resources by catalyzing a multi-sectoral and multi-stakeholder approach from national, sub-national, local and household levels. The investment will have strong approach to promote sustainable value chains, private sector involvement and use of other incentives to ensure environmentally, economically and socially sustainable approaches that build on traditional knowledge, as well as through use of modern approaches and technologies (such as ICT). The project will facilitate learning from global best practices on ABS as well as sharing of lessons from Indonesia internationally. The project will also promote the development of policies, measures and mechanisms for the implementation of the Nagoya Protocol. Through this approach, the project will address pillar III of CBD's guidance for the GEF-7, which requires the further development of biodiversity policy and institutional frameworks.

While there is an increasing interest commitment from national authorities to increasing agricultural diversity, there is a lack of an integrated approach to the conservation and sustainable use of crop diversity. It is essential to address immediate threats and underlying causes of genetic erosion in critical diversity hotspots, here targeted in the selected project sites. GEF funds will allow the consolidation of inter-institutional coordination at national regional and local levels, and promote the use of intelligence platforms and the adoption of new emerging technologies for conservation activities, improved monitoring and policy harmonization.

The project will identify increase connectivity through improved management of crop wild relatives and landraces, and increased social participation in the broader management strategy for sustainable agriculture, including the improved access to markets. Solutions proposed target appropriate entry points in order to justify GEF incremental financing, and maximize potential for transformational change in the food system and land use. GEF resources will support Indonesia's progress in complying with SDG targets. In the absence of a strategic approach, efforts will continue in a sectoral and fragmented manner without a focus on sustainability and long-term planning.

6) Global Environmental Benefits (GEFTF)

The global environmental benefits will accrue through continued existence of genetic diversity of selected crops (rice, taro, yam, clove and nutmeg) in their centres of origin, as outlined earlier in this PIF. Increased awareness on value of plant genetic diversity maintenance *in situ* and capacities of stakeholder partner with each other are also expected to lead to wider conservation impacts, such as through stakeholder also conserving crops that are not project targeted crops. The national, provincial and local governmental agencies, the local communities, farmers (especially women and young people), the academia and FAO will help deliver the following Global Environmental Benefits (GEBs) through this project:

- i) Securing species and varieties that constitute a reservoir of genetic resources and knowledge for global future security and future agricultural research;
- ii) Ensuring the conservation of local varieties (through ensuring the continuity of the diversification process), and reducing the uniformity of global crops and their vulnerability to extreme conditions;
- iii) Conserving genetic diversity which is fundamental to face future challenges - like food supply and adaptation of crops to upcoming social and environmental pressures (i.e. increase of global population and climate change);
- iv) Reintroducing and improving traditional landrace cultivars with potential for food use, which can broaden the range of products arising from agro-biodiversity;
- v) Providing tested methodologies, innovative mechanisms and lessons learned that can be scaled up in Indonesia, and adapted to other centers of origin around the world, through South-South Cooperation, the FAO network and the Commission on Genetic Resources for Food and Agriculture and Biodiversity[6]⁶;
- vi) Generating systematized documentation on species and varieties that are poorly known or threatened to be disused at present due to their lack of visibility;
- vii) Generating characterization and evaluation data of these species and varieties, including their ranges, the environmental conditions under which they thrive and resistance to pests, diseases or drought. This may support species exchange or promotion in appropriate zones, and in plant breeding programs;

- viii) Increased value addition of local agricultural products and incentivizing the access of poor farmers to local and regional markets in Indonesia to reduce the urban migration and increase opportunities for rural employment;
- ix) Through improved knowledge management, genetic resources can be provided in a timely manner to build resilience to biotic and abiotic stresses, including to extreme events such as drought, flood, pests and other natural disasters;
- x) Increasing the status of conservation of targeted species: improved knowledge, conservation and monitoring of diverse crops species.

The project is expected to contribute to effective *in-situ* conservation of over 1300,000 ha of rice, taro, yam, clove and nutmeg varieties through farmer management and their wild relatives in different parts of Indonesia. Indicative list of wild species of nutmeg, cloves, yams and rice recorded in Indonesia that would potentially benefit from this project are listed under Annex D

7) Innovation, Sustainability and Potential for Scaling Up The project will build on the baseline of commitments from the different Ministries (Agriculture, Environment and Forestry, Villages, and Planning), the GEF focal area mandate and the opportunities for transformational impact. There is currently a lack of application of the Nagoya Protocol to agricultural lands /non-protected area in the country. The project will work in this area by adopting the modality of application of the Nagoya Protocol already implemented forestry sector. The project will develop partnerships across sectors through the planning of the activities, their implementation and the periodic monitoring and evaluation. The establishment of effective partnerships institutions that have formerly had not collaborated closely will be innovative at the national level and crucial to the success of the project. Once the linkages have been established and effective working partnerships formed, it is expected that Indonesia will be well placed to act as a hubs for CWR conservation and on-farm management of plant genetic resources in the region and globally.

Strengthening the enabling environment is crucial for the long-term sustainability of the project's results. Component 1 focuses, to promote the fair and equitable sharing of benefits arising out of the utilization of genetic resources. This will be undertaken within the framework of the Nagoya Protocol and related instruments. The activities will support the implementation of ongoing initiatives or the initiation of new policies, programs, and plans in the field of conservation and sustainable use of crop diversity. The fair and equitable sharing of benefits arising out of the utilization of genetic resources (access and benefit-sharing or ABS) will be assessed and capacities developed for increased implementation of ABS mechanisms. The benefits (monetary or non-monetary) arising from the utilization of these resources or their associated traditional knowledge should be shared in a fair and equitable way and upon mutually agreed terms with the provider of these genetic resources or associated traditional knowledge. Parties are required to take measures with the aim of ensuring that traditional knowledge associated with genetic resources that is held by indigenous peoples and local communities (IPLCs) is accessed with the prior informed consent (PIC) of those IPLCs and that mutually agreed terms have been established.

Significant emphasis is placed on developing capacity for maintenance and management of the crop diversity in the wild and on-farm, with activities focused on participatory decision making and implementing conservation actions (Component 2). Strategies for the *in situ* conservation and on-farm management of crop diversity will include the development of inventories and methods for prioritizing conservation and sustainable use activities for the selected

five crops. Elements of these strategies will include developing action plans and adapting existing protected area management plans to include CWR.

Through its third Component, the project will focus on the strategy proposed for successful commercialization of underutilized species provided by the International Food Policy Research Institute (IFPRI)[7]⁷: expansion of demand; improved efficiency of production and special marketing channels; and, supply control mechanisms. It will seek to establish small-scale entrepreneurship, strong and fair partnerships between producers, dealers, consumers and other stakeholders in the production to consumption chain, and through a participatory integrated learning approach by all partners. The project will aim to establish a robust market for the farmer varieties and landraces locally, in the region and internationally. This will be achieved primarily through collection and dissemination of information highlighting the benefits of products from these varieties over those of regular/ordinary products. The project will build on the information gathered during the PPG to develop and disseminate a marketing strategy to promote farmer varieties of the five crops as special products targeting niche markets.

The project includes a major component (Component 4) on information management since initial baseline studies indicated that this was a major gap for effective conservation and management decision-making. Innovative communication tools will be used to bring the conservation and sustainable use of endemic crop diversity higher on the agenda of decision-makers and closer to the minds of the wider public.

The project will also ensure sustainability of its actions. This is already foreseen within the current framework as:

- diverse stakeholders will benefit from the planned capacity development activities;
- access to information for the effective, sustainable management and conservation of plant genetic diversity;
- promoting mutually beneficial partnerships across sectors and stakeholders.

The project will also support the development of an exit strategy to ensure sustainability of its actions.

[1] Rahman, W., Brehm, J.M. and Maxted, N., 2019. Setting conservation priorities for the wild relatives of food crops in Indonesia. *Genetic Resources and Crop Evolution*, 66(4), pp.809-824.

[2]Country Report on the State of Plant Genetic Resources for Food and Agriculture. 2009. <http://www.fao.org/3/i1500e/Indonesia.pdf>

[3] Guidelines for Developing a National Strategy for Plant Genetic Resources for Food and Agriculture <http://www.fao.org/3/a-i4917e.pdf>

[4] Voluntary Guidelines for the Conservation and Sustainable Use of Crop Wild Relatives and Wild Food Plants. <http://www.fao.org/3/a-i7788e.pdf>

[5] The Voluntary Guidelines for the Conservation and Sustainable Use of Farmers' Varieties/Landracess <http://www.fao.org/3/ca5601en/ca5601en.pdf>

[6]<http://www.fao.org/nr/cgrfa/cgrfa-home/en/>

[7] Gruère, G. et al 2006. Marketing Underutilized Plant Species for the Benefit of the Poor: A Conceptual Framework IFPRI, EPT

1b. Project Map and Coordinates

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



Central Kalimantan (Lamandau, Seruyan and Kapuas Districts).

Coordinates:

|

1. Kapuas District: 0°8'48" - 3°27'00" South Latitude and 112°2'36" - 114°44'00" East Longitude

2. Seruyan District: 0°77' - 3°56' South Latitude and 111°49' - 112°84' East Longitude

3. Lamandau District: 1°9' - 3°36' South Latitude and 110°25' - 112°50' East Longitude

(i)

(ii) Central Java (Klaten, Blora, Magelang Districts). Coordinates:

|

1. Blora District: 111°016' - 111°338' East Longitude and between 6°528' - 7°248' South Longitude

2. Magelang District: 110°12'30" - 110°12'52" East Longitude and 7°26'28" - 7°30'9" South Longitude

3. Klaten District: 110°30'-110°45' East Longitude dan 7°30'-7°45' South Longitude.

(iii) North Maluku (Tidore and Bacan Islands).T

Coordinates:

1. Tidore Island: 0°-20°North Latitude until 0°-50°South Latitude and on 127°10-127°45' East Longitude

2. Bacan Island: 0°40'0"South Latitude and 127°30'0"East Longitude

2. Stakeholders

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

Indigenous Peoples and Local Communities Yes

Civil Society Organizations Yes

Private Sector Entities Yes

If none of the above, please explain why:

Several key stakeholders were consulted during the PIF preparation. Of these, main government agencies consulted include the Ministry of Agriculture stakeholders (technical experts in post-harvest, horticulture and paddy), the Indonesian Centre for Agricultural Biotechnology and Genetic Resources Research and Development, (ICABIOGRAD), and the Sub-directorate on Genetic Resources of the Directorate of Biodiversity Conservation, Ministry of Environment and Forestry. Also consulted were the Director for Agricultural Institutions (National Planning Agency/BAPPENAS) and the Ministry of Villages, International Rice Research Institute (Indonesia office), and International Fund for Agricultural Development's Indonesia Office.

Key partners from the private sector consulted include:

- Staff from PT. Maxindo Karya Anugerah, a private sector on chip and cracker production;
- Plant breeders and agronomists at Mekarsari Fruit Gardens.

The lead executing agency consulted local governments in provincial level and regional commission on genetic resources for proposed provinces about the proposed project activities. Additionally, the Institute for Agricultural Technology Assessment under the MoA Research and Development who has worked closely with the farmers was involved actively in developing the PIF. The Institute undertook field visits to some of the proposed project sites for identification of local needs. Their in-depth knowhow on local community needs have been reflected in the PIF.

Meetings were also held with Non-Governmental Organizations (NGOs), as they are important for building capacity for GAPs in farming communities in the PIF preparation: specifically with Rikolto (formerly VECO/Vredeseilanden) is an international NGO, headquartered in Leuven, Belgium, working with IRRI on sustainable rice production in Central Java and the Kehati Indonesian Biodiversity Trust Fund is working on sustainable production of rice.

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.

STAKEHOLDER	RESPONSIBILITY	PROJECT ROLE
Indonesian Centre for Agricultural Biotechnology and Genetic Resources Research and Development	Provide oversight for the conservation on-farm of crop genetic resources as the gene pool Providing regulations for the conservation of genetic resources on- farm by harmonizing with existing regulations of forestry sector Mainstreaming biodiversity into agricultural areas Establishing a CWR database Implementation of the Nagoya Protocol in areas other than protected areas Harmonizaing regulations related to agricultural biodiversity with that of forestry Capacity development for stakeholders, including extensionists Conduct studies, research and development in agriculture Transfer plant production technology to public and private sectors	Project Executing Entity
Ministry of Environment and Forestry, DG of Natural Resources and Ecosystem Conservation	Implementation of the Nagoya Protocol Inventorying and monitoring the crop wild relatives of the target species Conduct studies, research and development for the conservation management plans of crop wild relatives	Project Executing Entity
BAPPENAS (National Development Planning Agency)	Develop and oversee integrated policies, measures, plans, mechanisms concerning the management of crop genetic diversity	Implementing partner for national level policy coordination for Component 1, project steering committee member

Ministry of Villages	Make policy recommendations and propose measures at the local level Promote linkages with other ongoing initiatives, especially TEKAD 2	Implementing partner for district level policy coordination for Component 1, project steering committee member
Agency for Food Security	Capacity building on agricultural extension and technology transfer on agricultural diversification	Implementing partner for Components 2-4, project steering committee member
Indonesian Beans and Tuber Research Institute	Conduct studies and research on agricultural extension and technology transfer on yams and taro	Implementing partner for Components 2-4, project steering committee member
Indonesian Spice and Medicinal Crops	Conduct studies and research on agricultural extension and technology transfer on clove and nutmeg	Implementing partner for Components 2-4, project steering committee member
Assessment Institute for Agricultural Technology	Conduct studies and research on the production strategies of the selected crops	Implementing partner for Components 2-4, project steering committee member

Local government in the selected districts and provinces	Formulate local development plans, protect, restore, maintain and utilize natural resources and environment at district level Undertake environmental monitoring and promote public participation in development and genetic resources management	Implementing partner for Components 1-4, project steering committee member
Local Communities in the five selected districts	Participate in protection, conservation and utilization of crop diversity in their areas	Implementing partner for Components 2-4, project steering committee member
International Research Rice Institute	Conduct studies and research on agricultural extension and technology transfer on local rices	Implementing partner for Components 2 and 3, project steering committee member
Indonesian Institute of Sciences	Conduct studies and research on agricultural extension and technology transfer on local crop diversity of the selected species	Implementing partner for Components 2 and 3, project steering committee member
Some indicative private sector stakeholders		

PT Kalbe Farma Tbk (Private sector)	The company is the largest healthcare provider in Indonesia and is interested in medicinal values of local crops. Contribute to value addition for the sustainable utilization medicinal values of local crops for natural/herbal health care products and services Potential investment mobilization	Implementing partner for Component 3
Soho Global Health (Private sector)	Contribute to value addition for the utilization medicinal values of local crops for natural/herbal health care products and services Potential investment mobilization The company has core competencies in the areas of natural/herbal health care products and services	Implementing partner for Component 3 Cooperation for the conservation and management protocols of the selected species and their propagation.
Mekarsari Fruit Garden (Private sector))	Conduct studies and research on agricultural extension and technology transfer on local crop diversity	Implementing partner for Components 2-4, project steering committee member
PT. Maxindo Karya Anugerah (Private sector)	Conduct studies and research on agricultural extension and technology transfer on local varieties of taro for value addition	Implementing partner for Components 3, project steering committee member cooperation in the field of biotechnology development for types of purple and red yams (tubers)
PT. Alam Sari Interbuana (PASI): 	The company focuses on nutmeg and clove for export	Partnership for value chain development
PT. Supa Surya Niaga: The 	company focuses on nutmeg and clove for export	Partnership for value chain development

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).

FAO's assessment of country gender assessment of agriculture and the rural sector in Indonesia (2019)^[1] has highlighted the important role women play in agriculture and natural resources management in the country. The report notes "In terms of the role of gender in protection of biodiversity, it is assumed that while men tend to be more concerned over soil and land conservation, women tend to be more concerned over biodiversity conservation, especially in relation to plants. A study in South and Southeast Sulawesi asserts that this is in line with men's and women's gender roles; i.e. they are most concerned with what they deal with most often in their daily lives. Usually, men deal with issues of soil and land erosion or landslides while women have the responsibility of fulfilling household nutrition, for which they rely on a variety of plant species from mixed gardens for food, as well as for medicine and

making simple tools (Mulyoutami et al., 2012).” Furthermore, it notes “women of Indonesia have traditionally been bearers and keepers of seeds that support the food security of their communities. In this sense, their overall contribution to flora biodiversity is significant. Additionally, they are holders of knowledge of traditional skills connected to their livelihoods, such as shifting cultivation/rotational agriculture and gathering of non-timber forest products, among others (Maranan, 2015)” The report notes, “In rice production, although predominantly a male activity, women are involved in seeding, planting, fertilizing, weeding/ cleansing the grass and harvesting. Preparation of land is the only task usually done by men alone (Ekowati et al., 2009; Maimunah 2014). Several case studies show the involvement of women in managing farming, seed preparation (including seed selection and seeding), fertilization, harvesting and marketing.” The report also highlights: “Additionally, women play a primary role in intercropping activities such as planting long beans, yams, taro and some other vegetable crops. These foods are used for the daily needs of the family. Rural women are also responsible for maintaining their home yards, planting vegetables for family consumption and/or sale”

The role of indigenous women as seed keepers and knowledge on seeds have also been highlighted by several studies. For example, in Kalimantan, women’s key role in local food systems as seed keepers and preserve many varieties of rice, sorghum, corn, millet but also tubers and vegetables has been reported[2]. In addition, roles of specific rank of women within the society also seems to play an important role in their knowledge of traditional varieties in some cases. In one case, amongst the Benuaq society around Muara Lawa District, of the 103 rice varieties that are found there, it was found that in general, all farmers could recognize about 40 % of the existing local varieties. Only the the senior members of the Benuaq society (such as the traditional law leader or the Mantiq, his wife, and three senior farmers) were able to identify all the rice varieties. The important role women play in maintaining home gardens/ agroforests that includes cloves and nutmeg has also been reported from Indonesia – such as in Sulawesi[3]. Here, women have been reported to play more role in tree crop selection than men.

[1] <http://www.fao.org/3/ca6110en/ca6110en.pdf>

[2] <https://wwf.panda.org/?339311/Women-as-Biodiversity-Stewards-in-HoB>

[3] Women’s participation in agroforestry: more benefit or burden? A gendered analysis of Gorontalo Province

Given the cross-sectoral nature of this project, gender-responsive activities will be integrated across the respective provinces and districts and related activities through the application of social safeguards, stakeholder engagement, institutional arrangements and capacity building. The project will aim at achieving the following gender-specific targets:

- Meaningful engagement of women and men in all decision making and other relevant activities;
- Women represent at least 50% of any decision-making body, committee, consultation or workshop;
- Provision of adequate technical and financial to support the integration of gender and women's empowerment considerations in all relevant outputs of the project;
- Gender-responsive design, collection, monitoring and reporting of biodiversity and socioeconomic data.
- The project will ensure gender assessments in the proposed landscapes during PPG to inform gender sensitive project development and implementation.

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; Yes

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

generating socio-economic benefits or services for women. Yes

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

Yes

4. Private sector engagement

Will there be private sector engagement in the project?

Yes

Please briefly explain the rationale behind your answer.

Involvement of the private sector and partner institutions (especially international institutions) will follow the rules of the Nagoya protocol, with clearly defined rules, such as on material transfer agreement, benefit sharing mechanism with farmers as providers of genetic resources (especially for types that are crop wild relative species).

Indicative engagement of the private sector in the project are listed below, and will be further clarified during full proposal development. **In addition, the project will also support potential development of farmer producer organizations that can take roles of value chain developers for different traditional varieties for crops selected for this project – including seed production.**

Some indicative private sector stakeholders		Potential project role
PT Kalbe Farma Tbk (Private sector)	The company is the largest healthcare provider in Indonesia and is interested in medicinal values of local crops. Contribute to value addition for the sustainable utilization medicinal values of local crops for natural/herbal health care products and services Potential investment mobilization	Implementing partner for Component 3
Soho Global Health (Private sector)	Contribute to value addition for the utilization medicinal values of local crops for natural/herbal health care products and services	Implementing partner for Component 3 Cooperation for the conservation and management protocols of the selected species and their propagation. Potential investment mobilization The company has core competencies in the areas of natural/herbal health care products and services
Mekarsari Fruit Garden (Private sector))	Conduct studies and research on agricultural extension and technology transfer on local crop diversity	Implementing partner for Components 2-4, project steering committee member
PT. Maxindo Karya Anugerah (Private sector)	Conduct studies and research on agricultural extension and technology transfer on local varieties of taro for value addition	Implementing partner for Components 3, project steering committee member cooperation in the field of biotechnology development for types of purple and red yams (tubers)

PT. Alam Sari Interbuana (PASI):	The company focuses on nutmeg and clove for export	Partenship for value chain development
PT. Supa Surya Niaga: The	company focuses on nutmeg and clove for export	Partenship for value chain development

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)

Under preliminary Environmental and Social screening undertaken at PIF stage by FAO, the project has been classified as moderate risk, especially from the fact that many sites where the project is proposing to work has indigenous people (please see the document uploaded in Document section for this PIF). These will be further elaborated during full proposal development and risk mitigation measures and will be undertaken as outlined below. Other risks to projects identified are also summarized below.

Risks	Risk rating	Mitigation measures
Policy risks: Compared to the improved varieties of staple crops, the government attaches less importance to the traditional local varieties and conservation of crop wild relatives.	Low	Prior to the formulation of any policy, research must be carried out in the agricultural systems, thus project officials including the National Project Director, are the first ones to obtain information related to the policy development. The project can develop response plans to mitigate the policy risk before the new policy is issued.
Market risk: An important aspect of this project is to reflect the market value of the genetic diversity of local varieties through markets, providing the farmers with relatively large benefit while at the same time protecting the genetic diversity. If the market is fluctuating or even falling back under the impacts of the external environment, it may affect the market outlook for the value addition of endemic crop diversity.	Moderate	The commercialization of the genetic diversity of local varieties is only one way for sustainable utilization; the project will enable farmers to benefits from the conservation and utilization of agricultural diversity. Market and business plans will be developed by the project to improve economic benefits and enhance market resilience of the traditional crop varieties.

<p>Co-financing risk: Due to the high proportion of project co-finance, the governments would be in difficulty if the economy were to decline during project implementation.</p>	<p>Medium</p>	<p>The co-financing commitments will be monitored and their status assessed during mid-term review and terminal evaluations. Given the current economic downturn related to global COVID 19 pandemic, there may be some constraints to government investments. However, governments may also see agriculture and natural resources management as a way to generate employment and to revive local economies.</p>
<p>Climate change risks: Indonesia's predicted change in climate and climate change impacts are expected to increase warming by 0.2-0.3°C per decade. Increasing annual precipitation across the majority of the Indonesian islands, except in southern Indonesia where it is projected to decline by up to 15%. Changes in the seasonality of precipitation are projected: parts of Sumatra and Kalimantan may become 10-30% wetter by the 2080's during December-February. A 30-day delay in the annual monsoon is projected, bringing a 10% increase in rainfall later in the crop year, April-June, and up to a 75% decrease in rainfall later in the dry season, July-September. Indonesia is predicted to experience temperature increases of approximately 0.8°C by 2030. Moreover, rainfall patterns are predicted to change, with the rainy season ending earlier and the length of the rainy season becoming shorter[1]</p> <p>Climate related hazard such as tsunami, as well cyclone (also known as hurricane or typhoon), river flooding and landslide hazards are classified as high risk according to the information that is currently available for Indonesia. Whilst, water scarcity and extreme heat events are considered medium risks[2]. These are expected to have negative impacts on selected crops for this project (rice, cloves, nutmeg, taro and yam). Please see Annex E for some preliminary information</p>	<p>Moderate to high</p>	<p>Conservation of genetic diversity of local crop diversity and their wild relatives <i>in situ</i> is expected to increase adaptation potential of the selected crops. In addition, the project will also strengthen appropriate storage, replication and sharing of seeds and germplasm so that these are not lost in times of climate hazards etc.</p>
<p>Socioeconomic risks: Local communities may be concerned about loss of their intellectual property rights over traditional varieties of crops and not having equitable benefits from any use of genetic resources, of which they are the traditional custodians, through their participation in this project</p>	<p>Moderate</p>	<p>The project will ensure that Free Prior Informed Consent is obtained from all communities it will work, and especially from indigenous people and that IPR are safeguarded as required under international best practices. Local communities will also be made aware of formal grievance mechanism, as per FAO requirements.</p>

[1] <https://climateknowledgeportal.worldbank.org/country/indonesia/climate-data-historical>)

[2] <http://thinkhazard.org/en/report/116-indonesia>

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.

The project will be coordinated by ICABIOGRAD of the Ministry of Agriculture and DG Natural Resources and Ecosystem Conservation of the Ministry of Environment and Forestry. Stakeholder meetings will be held regularly for synergizing the coordination of activities. Through FAO's online platforms, the stakeholders will liaise virtually on a regular basis. The provincial commissions on genetic resources link directly to the national commission on genetic resources. It is envisaged that coordination activities will be streamlined through these entities. There will be close linkages with the centres for the selected food crops and close collaboration with the Assessment Institute for Agricultural Technology and the provincial commissions on genetic resources to undertake activities in the field. The monitoring and reporting will be undertaken by FAO and ICABIOGRAD together with the provincial commissions. During the PPG process, the operational capacity assessment will be conducted of ICABIOGRAD with the intention of ICABIOGRAD being the main executing partner for the project. Other likely national executing partner includes DG Natural Resources and Ecosystem Conservation.

The coordination will be undertaken through the following steps:

Phase 1: Implementing agencies will coordinate, conduct meetings with stakeholders at the national level, DG level, ministries, agencies, NGOs, and the private sector to formulate action plans for achieving targets, and be inform each region with the subsequent results.

Phase 2: National level meetings held at the regional level with the relevant stakeholders including representatives from the provinces, regions, regional committees, and regional private sector companies.

Phase 3: Agreement is reached between national and regional governments, followed by field implementation in five districts in three regions

Phase 4: Hold a national meeting for monitoring, evaluation and planning every four months, producing weekly reports.

Phase 5. Raise awareness to the wider public of the project status and disseminate good practices through rewarding the most successful farmers for the conservation and sustainable use of crop diversity.

The urgent need to conserve, characterize and evaluate the threatened agro-biodiversity, promote its sustainable use and address the future needs for providing food for the world population has led to a marked change in the legislative environment over the last 15 years. This is evidenced by the coming into force of the International Treaty on Plant Genetic Resources for Food and Agriculture, which is hosted by FAO. FAO will support the coordination of the present project and link it with other agro-biodiversity initiatives worldwide, as it hosts its own Commission on Genetic Resources for Food and Agriculture. Established in 1983 to deal with PGRFA has since 1995, the Commission had its mandates broadened to encompass all components of biodiversity of relevance to food and agriculture, namely Animal, Forest and Aquatic genetic resources.

Since its establishment, the Commission has overseen global assessments of the state of the world's forest, plant and animal genetic resources for food and agriculture and negotiated major international instruments, including the International Treaty. The *Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture*^[1] for instance, was published under the auspices of the Commission in 2010. The monitoring of the implementation of the *Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture*^[2] also agreed under the auspices of the Commission in 2011 is yielding data that are being collated towards the publication of the Third Report. FAO also hosts the Secretariat of the Globally Important Agricultural Heritage Systems (GIAHS)^[3]; its mandates are also critically important for the current project and, like the Commission and the International Treaty, lessons that have been learned therefrom will be fed into the implementations of the activities being proposed under this project. FAO has also developed a track record of success leveraging its South-South Cooperation platform to share information, leverage expertise and pool resources for supporting activities in its member countries.

The project will ensure strong coordination with existing projects at proposed sites, such as with UNDP-GEF Strengthening Forest Area Planning and Management in Kalimantan (KalFor) Project to ensure no overlap between the on-going and proposed project and where possible both projects can support each other. The project will also ensure strong coordination with UNDO-GEF's Small Grants Project. Furthermore, the project will also ensure strong coordination with GEF7 UNDP-FAO-GEF FOLUR project currently under design at national and local levels. Since FAO and Ministry of Agriculture are both involved in FOLUR child project and this project, both will ensure strong coordination between these projects. Furthermore, strong coordination is also expected to be supported by the OPP's office. Specifically, coordination will be done for capacity building and communication related to rice, and related partnerships with the private sector related to the rice sector, as this crop is of common interest to both projects.

[1]<http://www.fao.org/agriculture/crops/core-themes/theme/seeds-pgr/sow/sow2/en/>

[2]<http://www.fao.org/docrep/015/i2624e/i2624e00.htm>

[3]<http://www.fao.org/giahs/en/>

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

This project will support Indonesia's Agriculture Development Strategy (2015-2045). This calls for 1. 2013-2015: Create foundation for a sustainable agricultural bioindustry; 2. 2015-2019: Strengthen the foundation for a sustainable agricultural bioindustry; 3. 2020-2024: Build a system of agricultural bioindustry; 4. 2025-2029: Create an independent and efficient food and agriculture; 5. 2030-2034: Create an independent and efficient agriculture and food security; 6. 2035-2039: Promote a quality and fair livelihood; 7. 2040-2044: Achieve a dignified, independent, developed, fair, and prosperous of Indonesia. The project will also contribute to Master Plan Acceleration and Expansion of Indonesia Economic Development (2011-2025). This Masterplan focuses on 8 main programs which consists of 22 main economic activities. The eight primary programs are: agriculture, mining, energy, industrial, marine, tourism, telecommunications, and the development of strategic areas. The strategic initiative of the Masterplan is to encourage large-scale investment in 22 primary activities: shipping, textiles, food and beverages, steel, defense equipment, palm oil, rubber, cocoa, animal husbandry, timber, oil and gas, coal, nickel, copper, bauxite, fisheries, tourism, food and agriculture, the Jabodetabek area.

Indonesian Biodiversity Strategy and Action Plan (IBSAP). The project is in line with IBSAP in terms of management of biodiversity; institution and resources to manage biodiversity; policy, strategy, and action plan on biodiversity management.

Nagoya Protocol National Report: Law Number 11/2013 on Nagoya Protocol ratification to support implementation of Nagoya Protocol in Indonesia. MoEF has issued some ministry regulations to support the law implementation including recent regulation issued by the minister Number P.2/2018 focusses on access on wild species' genetic resources and benefit sharing for its utilization. The regulation is now under evaluation. So far, no implementation of ABS has been done although some companies had a meeting with officers in Directorate Biodiversity Conservation discussing about the process of utilizing biodiversity in conservation area.

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.

Effective documentation and conversion of knowledge to relevant information (using knowledge from stakeholders that they generated through project implementation to document lessons learnt and best practices, and using data generated through use of tools and approaches), their management (through publications and maintenance of distribution list, publishing, databases and other information systems) and use (for capacity building, advocacy) are integral parts of this project. Building on strategic principles

that have been presented in FAO Knowledge Strategy 2011 - which include (adapted) and GEF's KM strategy, the project will strengthen "stimulating the generation, dissemination and application of information and knowledge, including statistics." Activities will include development of a Knowledge and Learning Strategy that is conceptually rigorous but practical and results-based and will also include strong elements for strategic communication. Capacity will be built so that the government can provide knowledge resources to those who need it, when they need it and in a format they can access and use. The project will ensure that the processes for implementing the Knowledge and Learning Strategy are iterative, and every opportunity will be taken to learn from both successes and failures. The knowledge strategy will also build on best practices, such as that have been outlined in Knowledge Sharing Toolkit (<http://www.kstoolkit.org/home>).

The Indonesia Clearing House Mechanism will be used to mainstream the information obtained from the project. The Clearing House provides effective media or information services on a global scale to facilitate the implementation of national strategic plans. It provides effective information services to facilitate the National Biodiversity Strategic and Action Plan. It is envisaged to hold monthly meetings with the MoEF as it is hosted there to discuss the information access and availability. The aim is to facilitate access to exchange of data and information between stakeholders in the field of national, regional and international scale as there is regular reporting to the CBD.

One of this project's objectives is to support the generation of improved information and to share this knowledge at the national level, regionally and internationally, and worldwide especially through FAO's World Information and Early Warning System on Plant Genetic Resources for Food and Agriculture (WIEWS)[1]. Snapshots of information available on WIEWS will feed into the preparation of the Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture. Indonesia has commitments to provide data for this report and this project enhances the country's capacity to fulfill this commitment – in addition to the more immediate and direct benefit of providing data on these irreplaceable resources in the country for posterity. Component 1 and Component 4 support this objective directly. The project design and implementation phase will be based on a participatory approach. Knowledge will be systematized in collaboration with the communities that hold and have protected it throughout the centuries. Academia and FAO officers will work at field level, by cooperating with grassroots organizations who speak the language of the communities, to ensure that traditional knowledge is valued and protected. The project will support Indonesia Clearing House Mechanism to strengthen their resources and materials related to *in situ* conservation and sustainable use of plant genetic resources in the country.

s[1] <http://www.fao.org/wiews/en/>

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
Ms Laksmi Dhewanthi	GEF Operational Focal Point	Ministry of Environment and Forestry	3/11/2020

ANNEX A: Project Map and Geographic Coordinates

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