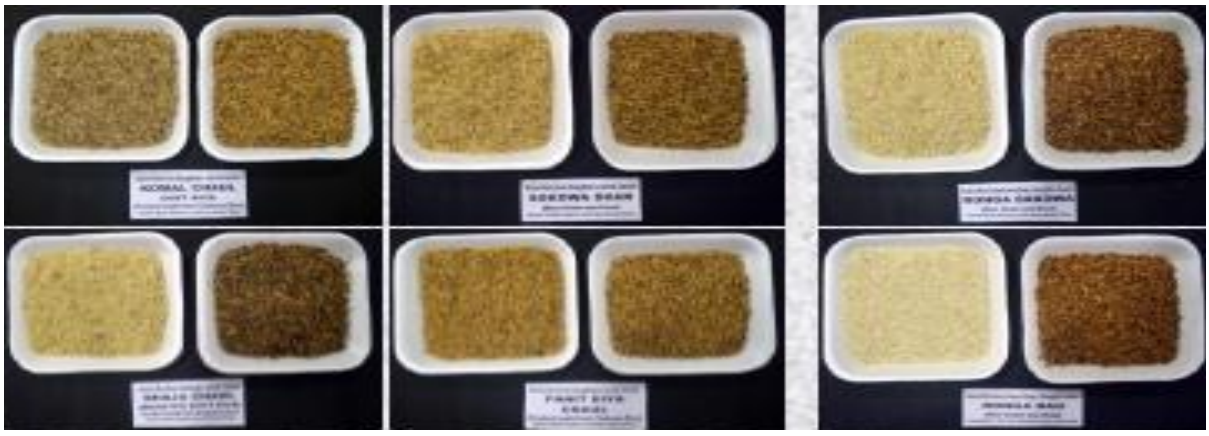
Mid-Term Review

of

UN Environment Implemented GEF Project

'Mainstreaming Agricultural Biodiversity Conservation and Utilization in Agricultural Sector to Ensure Ecosystem Services and Reduce Vulnerability'

Jointly Executed by Bioversity International & ICAR



Variability in Rice from North- Eastern Region of India

Disclaimer
This report has been prepared by an independent consultant for the Office of the GEF the UN Environment. The findings and conclusions expressed herein do not necessarily reflect the views of the Member States or the UN Environment Senior Management.

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Director General, Indian Council of Agricultural Research, DARE, GoI, New Delhi & Chair, National Project Steering Committee

Chairperson, PPVFR Authority, New Delhi

Vice Chancellor, AAU, Jorhat, Assam

Vice Chancellor, IGKVV, Raipur, Chhattisgarh

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Scientists associate with the Project

NGOs partners and

Farmers of the four Agro-eco Regions

Biographical Note on the Reviewing Consultant

The Reviewing Consultant is based in Noida- a suburb of New Delhi after retiring from the Borlaug Institute for South Asia as its Director General. Prior to that he worked as Director and Vice Chancellor of the Indian Agricultural Research Institute Delhi, an apex institute of the Indian Council of Agricultural Research, known to be the seat of 'Green Revolution' in India. His career spans over 40 years during which he worked as an active researcher, research team leader and research manager of agricultural research institutes in various parts of India. He also did two Post-Docs in Great Britain and the USA. Of late, he was a consultant in GEF-funded 'Green Agriculture Project' and FAO-sponsored project on Implementation of National Agricultural Policy in Bangladesh. During the last 40 years of his research career, Dr. Gupta worked in different parts of India including the states situated in the north-eastern & north-western hill along with plains of the north and central India where he was associated with the development of more than 50 varieties of food crops *viz*, rice, wheat, maize, millets, legumes, pseudo-cereals and oilseeds. Towards later part of his research career, he led development of India's first short duration 'Quality Protein Maize' hybrid biofortified with β-carotene (Vit-A) and α-tocopherol (Vit- E). His research contributions have been recognized at the National as well as International levels through several honors and awards. He has authored more than 150 peer reviewed research papers. In recognition of his contribution to the field of agricultural Sciences, Dr. Gupta has been conferred with D.Sc. (*h.c.*) by two leading Agricultural Universities of India. He is a fellow of the National Academy of Agricultural Sciences and has held presidency of the Indian Society of Genetics and Plant Breeding during 2011-13.

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SECTION-IV CONCLUSION AND RECOMMENDATIONS

ANNEXURES

Abbreviations:

AU	Agricultural University
AAU	Assam Agricultural University
ABS	Access and Benefit Sharing
AEZ	Agro-ecological Zone
AICRP	All India Coordinated Research Project
AUJ	Agriculture University of Jodhpur
ASA	Action for Social Advancement
BDA	Biodiversity Act
BMC	Biodiversity Management Committee
BSP	Bali Strategic Plan for Technology Support and Capacity Building
CAZRI	Central Arid Zone Research Institute
CBO	Community Based Organizations
CD	Chhattisgarh
CTR	Central Tribal Region
CSB	Community Seed Bank
CSKHPKV	Chaudhary Sarvan Kumar Himachal Pradesh Krishi Vishwavidyalaya
DARE	Department of Agriculture Research and Education
DRI	Deendayal Research Institute
FDI	Foundation for Development Integration
FGD	Focused Group Discussion
GEF	Global Environment Facility
GEFTF	GEF Trust Fund
Govt.	Government
GoI	Government of India
GRAVIS	*Gramin Vikas Vigyan Samiti*
HP	Himachal Pradesh
HRG	Himalayan Research Group
HYV	High Yielding Varieties
ICAR	Indian Council of Agricultural Research
IGKVV	Indira Gandhi Krishi Vishwa Vidyalaya
J&K	Jammu & Kashmir
KVK	*Krishi Vigyan Kendra* (Farm Science Centers)
LCM	*Lok Chetana Manch*

MP	Madhya Pradesh
MVDA	Mount Valley Development Association
NBA	National Biodiversity Authority
NBAP	National Biodiversity Action Plan
NBPGR	National Bureau of Plant Genetic Resources
NCE	No Cost Extension
NGO	Non-Government Organization
NER	North Eastern Region
NWH	North Western Himalaya
PC	Project Coordinator
PD	Project Director
PMU	Project Management Unit
PPB	Participatory Plant Breeding
PPVFRA	Protection of Plant Variety and Farmers' Authority
ProDoc	Project Document / proposal
PSC	Project Steering Committee
PVS	Participatory Variety Selection
Raj	Rajasthan
RC	Regional Coordinator
RS	Regional Station
RVRSAU	*Rajmata Vijaya Raje Scindhia* Agricultural University
RCU	Regional Coordinating Units
RHoMIS	Rural Household Multiple Indicator Survey
SDG	Sustainable Development Goal
SHG	Self-Help Group
S-SC	South-South Cooperation
TM	Task Manager
UA	Uttaranchal
UNEP	United Nation Environment Program
UT	Union Territory
VPKAS	*Vivekanand Parvatiya Krishi Anusandhan Sansthan*

PROJECT IDENTIFICATION

Project Title:	Mainstreaming agricultural biodiversity conservation and utilization in agricultural sector to ensure ecosystem services and reduce vulnerability		
Executing Agency:	Bioversity International; Indian Council of Agricultural Research (ICAR), New Delhi, India		
Geographical Scope:	National: India		
Participating Countries:	India		
GEF project ID:	5137	**IMIS number*[1]:**	GLF-11207-14AC0003-SB-006538
Focal Area(s):	Biodiversity	**GEF OP #:**	BD
GEF Strategic Priority/Objective:	BD-2	**GEF approval date*:**	20 January 2016
UNEP approval date:		**Date of first disbursement*:**	17 January 2017
Actual start date[1]:	30 November 2016	**Planned duration:**	60 months
Intended completion date*:	January 2021 (*60 months after signing of contract*)	**Actual or Expected completion date:**	Jan. 16, 2022 (*60 months after first fund disbursement*)
Project Type:	FSP	**GEF Allocation*:**	US$ 3,046,347
PPG GEF cost*:	US$ 150,000	**PPG co-financing*:**	US$ 442,051
Expected MSP/FSP Co-financing*:	10,294,750	**Total Cost*:**	US$ 13,341,097
Mid-term review/eval. (planned date):	Sept. 2021	**Terminal Evaluation (actual date):**	TBD

EXECUTIVE SUMMARY

1. Biodiversity and human society have existed together in a close and complex association over many millennia. Agricultural biodiversity that exists in and around India's different agro-ecosystems is used as food, forage, medicine, fuel, building material, or clothing and many other uses; the most important being the food. Crop genetic diversity is particularly rich in some parts of India and plays a major role in the livelihood strategies of rural and farming communities. This biodiversity, however, has been fast eroding after onset of 'Green Revolution' of mid-1960s. Therefore, conservation and use of land races are vital in meeting the unforeseen future demands of society especially under the changing climate and newer biotic and abiotic stresses evolved due to global warming. It is expected that increased diversity, both of traditional varieties and new materials, will have to be deployed to combat these problems. Consequently, continued availability of the unique diversity present in India's traditional crop varieties will be central to achieving these objectives. The present project, funded by the Global Environment Facility's Trust, is a full project with a total allocation of US $ 13,341,097 out of which, US $ 3.046,347 (22.83%) is in the form of direct GEF Trust fund and US $ 10,294,750 (77.17%) is in the form of Co-finance from the Government of India through Indian Council of Agricultural Research, State Agricultural Universities and Non-Government Organizations. The geographical coverage of this project is limited to the north-eastern region, north-western Himalayan region, hot arid western region and central tribal region wherein nearly half of the area is inhabited by the disadvantaged hill and tribal farmers dominated by the women folk. Fig. 1 shows the location of project sites and crops selected to work on.

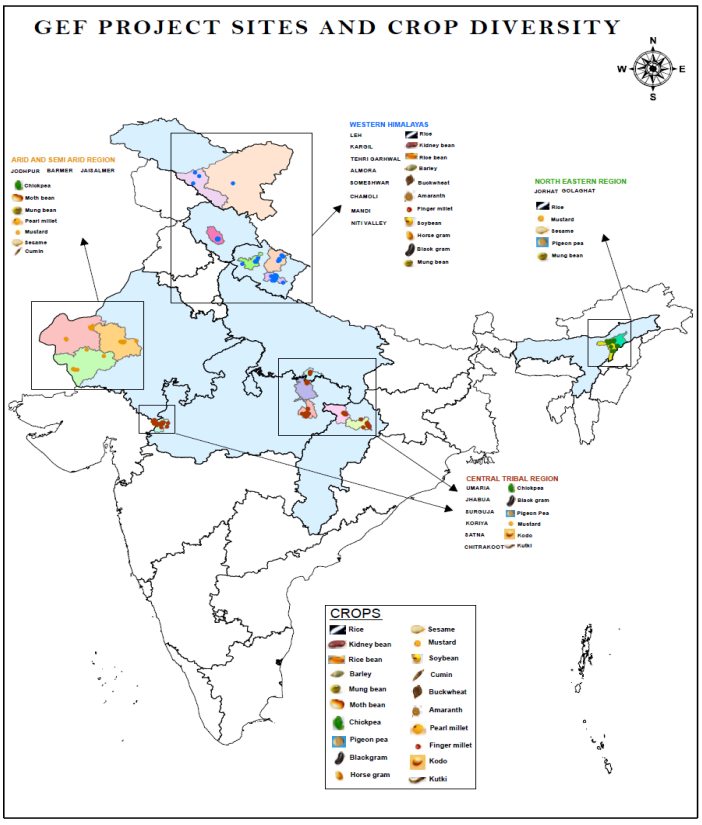


Fig. 1 Location, Area Coverage and Crops under the Project in India

2. The project with 20 sites and 20 crops spread over 4 diverse ecosystems across India, is expected to develop local community-based approaches, together with the necessary national framework to mainstream India's agricultural production and environmental management strategies through the following three inter-linked components:

   Component-1. Adaptive management of crop diversity of 20 crops for resilient agriculture and improved livelihoods.

   Component-2. Strategies and policies for sustainable conservation and use of crop diversity including access and benefit sharing (ABS).

   Component-3. Improved agricultural support systems, institutional frameworks and partnerships that support crop diversity on farm through improved research, outreach & extension at national, regional and local levels.

3. The implementation of the project started with signing of the contract with partners in October 2017. Inception workshop was held as planned and all the partners attended and were sensitized about the GEF/UNEP MTS on environmental priority, Agenda for 2030 on Sustainable Development Goals, Gender Equity, Bali Strategic Plan for Technology Support and Capacity Building (BSP) as well as South-South Cooperation (S-SC).

4. After completing 03 years of work (in Dec. 2020), the UNEP commissioned a Mid Term Review. The most salient accomplishments of the project are listed as follows:

   I. One hundred sixty one (161) varieties identified from 2,762 landraces selected through PVS for the diverse use of farmers

Sl No	Crop	No. of Variety		Sl No	Crop	No. of Variety
i.	Rice	74		xi.	Moth Bean	4
ii.	Barley	4		xii.	Mung Bean	7
iii.	Pearl Millet	7		xiii.	Horse gram	2
iv.	Finger Millet	4		xiv.	Black Gram	5
v.	*Paspalum* (*Kodo*)	3		xv.	Check pea	4
vi.	*Panicum* (*Kutki*)	3		xvi.	Pigeon Pea	10
vii.	Buckwheat	3		xvii.	Soybean	2
viii.	Amaranth	8		xviii.	Sesame	4
ix.	Rice Bean	4		xix.	Mustard	4
x.	Kidney Bean	7		xx.	Cumin	2

   II. Twelve products identified for value chain
   III. Market value chain for nine crops completed many of which are rich in protein, essential amino acids and micronutrients like Fe and Zn
   IV. Five products commercialized and new markets established for them
   V. Nutritional profiling 639 farmers' varieties completed
   VI. Five local Seed networks established in all four agro-eco-regions
   VII. Twenty nine community seed banks established at 17 project sites
   VIII. Two thousand five hundred (2,500) native varieties conserved in community seed banks.

IX. Seed Multiplication of 161 farmers' varieties in place
X. Sixteen Community diversity registers at ten project sites in place
XI. Two hundred ninety-eight (298) farmers varieties submitted to PPVFR Authority for registration and certificates for 59 of them issued
XII. Forty five crop diversity fairs, 149 workshops, 162 field day and 194 famers meetings organized at project sites
XIII. A strong network of four ICAR institutes, five SAUs, eight KVKs (Farm Science Centers) & seven NGOs established.
XIV. Six training workshops conducted till Dec, 2020
XV. Potential value added products from nine crops identified and five of them (of rice) launched as '**Native Basket**'**.**
XVI. A National Webinar entitled "Implementation of Access to Plant Genetic Resources and Benefit sharing" with around 200 participants held during 2020 and recommendations made for facilitating access and Benefit Sharing.

5. The project has successfully identified 161 elite land races of 20 crops, value chain analysis was done for 9 crops and value chain product launched for one crop i.e. rice. Rest of the 19 crops have more or less the same potential, therefore, a concerted effort is needed to replicate in other crops on the pattern of rice. These land races with unique attributes have existed with the farmers for a very long time but in absence of the planned and systematic efforts, they could not see the light of the day. The current project has, therefore, acted as a catalyst in mobilizing farmers to acquaint themselves with the advantage of crop diversity, their conservation and utilization which will result in mainstreaming of the biodiversity especially of the 20 crops selected in this project. The project has been successful in establishing a strong network of institutions comprising of four Institutes of the Indian Council of Agricultural Research, five State Agricultural Universities, eight *Krishi Vigyan Kendrs* (Farm Science Centers) situated in each districts of India and seven Non-Government Organizations), who with active partnership, have been able to exceed the mid-term targets in component -1 and component-3 despite several constraints. The project has, however, not been so successful with component-2 dealing with policy advocacy and ABS mainly because of restrictions on holding meetings and travel by the Government of India due the pandemic of Covid-19 for almost 14 months (March 2020 to May 2021). In my opinion, the project staff is though capable of achieving all the targets, the same could not be accomplished in Component-2 due to these external challenges.

6. Overall, the project has been able to attain the outcomes (at mid-term) of component-1 and component-3 but runs short of target in the outcome of component-2, some activities like regional and national meetings were not organized presumably because of restrictions on travel and meetings due to covid-19's pandemic, which was beyond control of the project.

The Overall rating of the project at mid-term is HIGHLY SATISFACTORY (HS) with following details:

Categories	Summary Assessment	Rating
A. Strategic Relevance	Very Relevant	**HS**
1. Alignment to UNEP's MTS and POW	Fully aligned	HS
2. Alignment to Donor/GEF strategic priorities	Fully aligned	HS

Categories	Summary Assessment	Rating
3. Relevance to regional, sub-regional and national environmental priorities	Relevant	HS
4. Complementarity with existing interventions	Total	HS
B. Effectiveness	Very effective	**MS**
1. Availability of outputs	Delayed & inadequate	MS
2. Achievement of project outcomes	As Planned except Comp.-2	MS
3. Likelihood of impact	Likely to be impactful	L
C. Financial Management	Slow and Tardy	**S**
1.Adherence to UNEP's policies and procedures	Complete	S
2.Completeness of project financial information	Complete	S
3.Communication between finance and project management staff	Complete	S
D. Efficiency	Efficient & effective	**S**
E. Monitoring and Reporting	On time & complete	**HS**
2. Monitoring of project implementation	Timely	HS
3.Project reporting	Accurate	HS
F. Sustainability	Likely	**L**
1. Socio-political sustainability	Sustainable	HL
2. Financial sustainability	Sustainable	L
3. Institutional sustainability	Sustainable	L
G. Factors Affecting Performance and Cross-Cutting Issues	Adversely effecting factors* beyond control	**S**
1. Preparation and readiness	Fully prepared	HS
2. Quality of project management and supervision[i]	Very good	S
3. Stakeholders participation and cooperation	Total	S
4. Responsiveness to human rights and gender equity	Responsive	HS
5. Environmental, social and economic safeguards	Compliant	HS
6. Country ownership and driven-ness	Complete	HS
7. Communication and public awareness	Good	S
Overall Project Rating		**HS**

*Pandemic of Covid-19 was beyond control

7. The delayed start of the actual implementation of the project during 2017 coupled with Covid-19's pandemic during 2020 has hindered the project implementation especially in Component-2, whereas in reviewer's opinion the project was capable of not only achieving the targets fixed for the mid-term of the project but exceeding the same. In view of the fact that 45% of the GEF Trust Fund and 35% of Co-finance remains unutilized on Dec. 31, 2020, therefore, in reviewer's opinion, a No Cost Extension for eighteen (18) months (Please see the detailed justification given in **16.2.1 (on page no. 59)** will enable the project to work for **four more crop seasons** (two summer and two winter) and thus, in all likelihood help the project attain the objectives originally proposed and outcomes envisioned in the Project Document.

SECTION I: PROJECT BACKGROUND AND OVERVIEW

1. General Information

8. The current project officially started on January 17, 2017 with sixteen partners comprising of four Institutes of the Indian Council of Agricultural Research (ICAR), five State Agricultural Universities (SAUs) and seven Non-Government Organizations (NGOs). This is a full project with a total allocation of US $ 13,341,097 (thirteen million, three hundred forty-one thousand and ninety seven US $ only) out of which, US $ 3.046,347 (three million, forty six thousand, three hundred and forty seven US $ only) (22.83%) is in the form of direct GEF Trust fund and US $ 10,294,750 (ten million, two hundred ninety four thousand, seven hundred and fifty US $ only (77.17%) is in the form of Co-finance from the Government of India through ICAR institutions and SAUs. The geographical coverage of this project is limited to the north-eastern region (NER), north-western Himalayan states, hot arid western region and central tribal region. Thus, nearly half of the area is inhabited by the disadvantaged hill and tribal farmers wherein agriculture is dominated by the women folk. In addition, originally twenty sites were proposed of which two were replaced, thus total number remained twenty only. One of the statutory body supported by the Government of India (GoI); Protection of Plant Varieties and Farmers' Right Authority (PPVFRA), decided to withdraw from the project due to being a regulatory authority. Consequently, its co-financing part was distributed to other partners without effecting the total Co-finance. In fact, the planned Co-finance was revised to US$ 10,809,750 which is US$ 515,000 more than the originally proposed amount. Upon completion of around three years in Dec. 2020, a Mid Term Review (MTR) was commissioned and this report is the output of the MTR. This MTR was supposed to be submitted in mid-June, 2021 but due Covid-19 pandemic, it was extended till September 15, 2021.

1.1. Description of the Project

9. India possesses globally important agricultural biodiversity which is central to the livelihoods of the small-scale farmers, rural communities and indigenous peoples and which makes an essential contribution to the country's resilience and adaptability. Biodiversity and human society have existed together in a close and complex association over many millennia. A rich diversity of ecosystems and species exist in environments that have been managed, used and maintained or altered by humans for over five thousand years. This project focuses on agricultural biodiversity specifically of crop species, and on the inter- and intraspecific diversity that exists on farmers' fields. The improved conservation and use of agricultural biodiversity can make an essential contribution, not only to improving livelihoods of farmers, rural communities and indigenous peoples, but also to agricultural sustainability, the maintenance of ecosystem function and to improved adaptability and resilience in the face of change, especially climate change. Securing enhanced maintenance and use of agricultural diversity depends on its continued inclusion in production systems and, as production conditions and climates change, it is expected that increased diversity, both of traditional varieties and new materials, will need to be deployed. The continued

availability of the unique diversity present in India's traditional crop varieties will be central to achieving these objectives. This project addresses the multifaceted challenges of conserving and using unique diversity of 20 crops of major importance in 4 eco-regions chosen by virtue of the value of the diversity found in the regions and the contribution that it can make. The project approach embeds the inclusion of crop and genetic diversity into the livelihood and development strategies through their use in adaptation and income generation in the selected eco-regions.

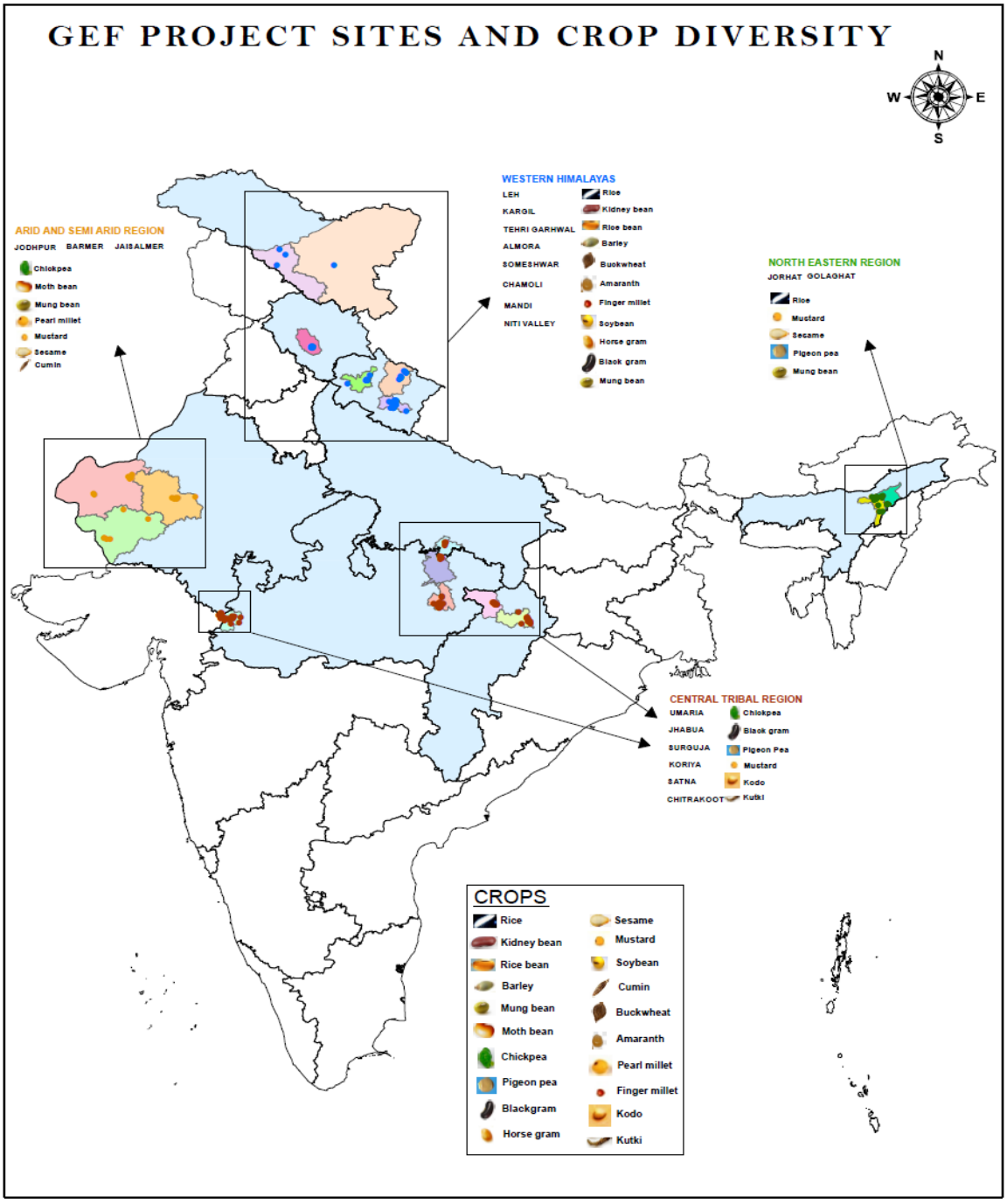


Fig. 1 Location, Area Coverage and Crops under the Project in India

10. The twenty crops proposed to be mainstreamed are rice, barley, finger millet, pearl millet, amaranth, buckwheat, pigeon pea, kidney bean, green gram, moth bean, rice bean, black gram, mustard and sesame in four agro-eco regions. The Project is designed to implement activities in a set of intervention sites distributed across four contrasting agro-ecosystems, *viz*. (i) Western Himalayas including the cold arid tract; (ii) North-eastern region and the Eastern Himalayas; (iii) Western arid/semi-arid region; and (iv) Central tribal region of Madhya Pradesh and adjoining tract of Chhattisgarh, each of which possesses valuable and unique but threatened agricultural biodiversity in crops like rice, barley, amaranths, buckwheat, pearl millet, finger millet, pigeon pea, moth bean, cowpea, black gram, green gram, kidney bean, mustard, sesame, as well as several horticultural crops (primarily vegetables). This will allow both farm level and agro-ecosystem dimensions to be explored and supported by the development of a strong national framework able to mainstream the results to other regions as well. The four contrasting agro-ecosystems were selected because each agro ecosystem has its unique crops and their associated diversity adapted to diverse agricultural practices, weather pattern and socioeconomic systems. Therefore, working on these contrasting eco-systems will help develop models, which can be replicated and up scaled to other sites nationally as well as globally.

11. Twenty sites in 4 diverse ecosystems across India were identified and selected in view of the current status of the biodiversity and threats prevailing in the 4 important agro-eco regions. The project is expected to develop local community-based approaches, together with the necessary national framework that will enable the conservation and use of crop diversity to be mainstreamed in India's agricultural production and environmental management strategies. This will be achieved by the following three inter-linked components:

    1. Adaptive management of crop diversity for resilient agriculture and improved livelihoods through adoption of at least 25,000 farmers across four agro-eco-regions covering 120,000 ha in India will maintain and use an increased availability to diversity of 20 crops which enhances adaptation, resilience and improves income generation opportunities.

    2. Strategies and policies for sustainable conservation and use of crop diversity including access and benefit sharing through mechanisms for improved coordination and implementation to promote better mainstreaming of conservation, use and sharing of crop diversity developed and supported by relevant policy instruments, regulations, strategies and plans including access and benefit sharing.

    3. Improved agricultural support systems, institutional frameworks and partnerships that support crop diversity on farm through Improved Research, Outreach and Extension), Institutional Frameworks and Partnerships at national, regional and local level to ensure improved agricultural biodiversity conservation, adaptability, resilience and farmer livelihoods.

12. The project was started with receipt of 1st GEF Grant on Jan 17, 2017; however, the Project Coordinator joined on Sept. 01, 2017 and PMU was established on Oct. 01, 2017. Thus, the work on the project was actually started from Oct. 01, 2017 with formation of PMU. After passage of 30 months, India faced a pandemic of Covid-19

virus which led to complete lock down in the country for 66 days starting from March 25, 2020. Thereafter, work was resumed but at low pace because of restrictions on free movement. India faced 2nd wave of covid-19 again in April 2021 followed by a lockdown. Thus, project work slowed down considerably during 14 months from April 2020 to May 2021. Coincidentally, both the lockdowns came into force at the time of sowing of summer *(Kharif*) crops, which adversely affected normal work during summer of 2020 as well as 2021.

2. Rationale

13. The high-yielding varieties of the Green Revolution era (during 1960s) vastly displaced landraces and farmers' varieties on an enormous scale, especially in the areas most favored for production of the staple food crops like rice and wheat. With increased production of wheat and rice, area under cultivation of nutria-cereals (called as coarse grains) like finger millet, small millet, amaranth, buckwheat and pearl millet declined gradually and with that the local land races of these crops started disappearing from farmers' field. Accompanied with this, was higher return to the farmers from cultivation of dwarf varieties of wheat and rice with assured procurement from the Government of India (GoI) which gave higher return and therefore, farmers shifted legumes (the pulses), a rich source of protein for vegans in India to marginal lands. This marginalization of pulses *viz*. gram (chick pea), black gram, green gram, horse gram, moth bean, kidney bean and pigeon pea to rain-fed areas resulted in huge loss of a large number of land races of these crops. In addition, GoI's emphasis on increasing production, encouraged adoption of high yielding varieties (HYVs) and consequent upon this; there was huge reduction in the number of the land races of cereals, which were although low yielding and less responsive to chemical fertilizers but with many desirable attributes like pest resistance, quality and abiotic stress tolerance.

14. While scientists worked to collect and store as much as they could of the agricultural biodiversity that remained in gene banks *ex situ*, away from farmers' fields, they continued to worry about declining biodiversity in the field. In farmers' fields, crops and varieties continued to evolve as a result of natural and artificial selection. Therefore, conservation and use of land races of various food crops would help in meeting the unforeseen future demands of society especially under the changing climate and newer biotic and abiotic stresses evolved due to global warming. In addition, some of the land races of the 20 crops taken up in this project have many desirable traits especially nutritional attributes like, high protein and micronutrients, complex carbohydrates that digests slowly and thus good for diabetics etc. With several desirable attributes the land races are liked by the consumers; however, in absence of value chain and marketing channels there exists wide gap between the growers of the land races and consumers.

15. This project was conceived by the Bioversity International (BI) for not only mainstreaming of the land races of these crops but detailed analysis of their nutritional quality along with establishment of their value chain. In addition, the project was also entrusted with advocacy of the need for cultivation of land races with the GoI and other

stakeholders. GoI, in turn, willingly came forward to co-finance the project by involving scientific manpower of the National Bureau of Plant Genetic Resources at large scale. Thus, UNEP/GEF and GoI joined hands to support this project with a hope of mainstreaming agricultural biodiversity conservation and utilization in agricultural sector to conserve the ecosystem and reduce vulnerability to climate change which poses threat to the agriculture and food system in tropics and subtropics.

3. Result Framework

3.1. Theory of Change

16. The prevailing crop diversity in India remains under threat from the continuing adoption of modern high yielding varieties (HYVs), changes in agricultural practices, social trends, national policy to promote HYVs and its associated subsidized agro-chemicals, weak seed system of land races and climate change; yet, crop diversity that exists in several pockets around India continues to be a major natural asset and represents an essential element in the livelihood strategies of the rural population. Traditional crops and varieties conserved by the Indian farmers over generations have although been utilized in crop improvement programs but they are not widely cultivated due low net profitability. It is the small and marginal farmers, many of them located in far flung and tribal belts in the country, who continue to grow landraces and conserve biodiversity in agricultural crops. This crop diversity can not only be maintained but widely utilized by the farmers, if their unique attributes like (nutrition, aroma, grain type, pest resistance and palatability) are identified, publicized and promoted along with their value chain, the net profitability of all the elite land races can be enhanced significantly; thereby attracting the farmers to cultivate, maintain and adopt the at large scale especially by the small and marginal farmers.

3.2. Result Framework

17. The current project aims to mainstream crop biodiversity conservation and utilization in agriculture sector for enhancing income & livelihood security of the farmers and to reduce vulnerability to climate change that has turned out to be the biggest threat to agriculture especially in tropical and subtropical part of the globe. The Result Framework was revisited and completed in 2019.

4. Executing Arrangements

18. The overall management of the project is in the hands of a Project Coordinator (PC), Dr Jai C Rana, who heads a Project Management Unit (PMU) and also holds the charge of Project Director (PD) The PC is assisted by an ICAR Coordinator (Dr SP Ahlawat, Principal Scientist from NBPGR, New Delhi) and 4 Regional Coordinators. In the four agro-eco Regions. Each regional coordinating unit (RCU) consists of 1-5 institutions along with at least one non-government organization (NGO) with several scientists and technical/contractual staff. The RCUs are managed and monitored by the Regional Co-ordinators. The field work is attended by the scientific and technical/contractual personnel.

The following flow chart shows Command and Control of the Executing Arrangement:

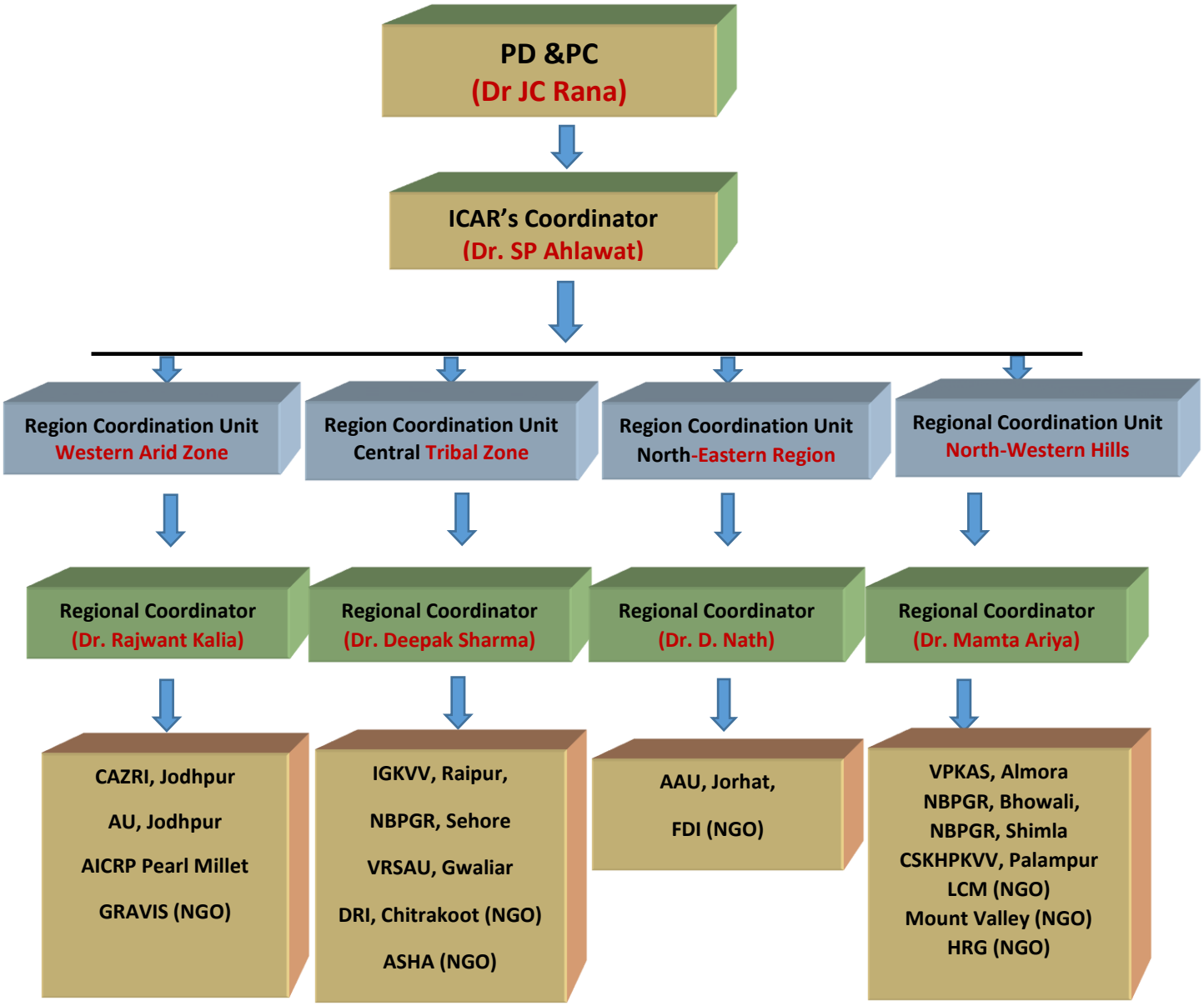


Fig. 2. Flow Chart of the Executing Arrangement

5. Project Cost and Financing

5.1 Project Cost

19. The current project has an allocation of US $ 13,341,097 (thirteen million, three hundred forty-one thousand and ninety seven US $ only) out of which, US $ 3.046,347 (three million, forty six thousand, three hundred and forty seven US $ only) (22.83%) is in the form of direct GEF Trust fund and US $ 10,294,750 (ten million, two hundred ninety four thousand, seven hundred and fifty US $ only (77.17%) is in the form of Co-finance from

the Government of India through its institutions, Bioversity Intl. and NGOs. The financial plan summary is presented in Table 1.

Table 1. Financial Plan Summary

Components	GEF	Co-financing
Component 1	1,073,935	4,537,310
Component 2	601,330	2,216,400
Component 3	766,762	1,968,540
Component 4 M&E	327,380	507,000
Component 5 Mnt	276,940	1,065,500
	3,046,347	**10,294,750**

Table 2 Planned Co-financing by source and components in USD

Sources of co-financing	Name of co-financer	Type of co-financing	
		Grant (US$)	In-kind (US$)
National government (Executive agency)	ICAR and its institutes	2,941,000	2,068,500
National government	PPV&FRA	1,040,000	315,000
International agency (Executive agency)	Bioversity International	2,600,000	400,000
NGO	Action for Social Advancement (ASA)	200,000	100,000
NGO	Gramin Vikas Vigyan Samiti (GRAVIS)	120,000	80,000
NGO	Lok Chetna Manch (LCM)	0	100,000
NGO	Mount Valley Development Association (MVDA)	0	80,000
NGO	Himalayan Research Group (HRG)	50,000	100,000
GEF agency	UNEP	0	100,250
	Sub-total	***6,951,000***	***3,343,750***
	TOTAL		**10,294,750**

5.2 Revised Co-finance

20. The PPVFRA, one of the proposed partners, decided to withdraw from the project in view of it being a Regulatory Authority of the Government of India. Resultantly, the Co-finance was redistributed among the existing partners as shown in Table 3 and it turns

out to be higher by US $ 515,000 (Five hundred fifteen thousand US$ (Table 3) than the originally GEF endorsed US$ 10,294,750 for Co-finance.

Table 3. Revised Planned Co-finance after Withdrawal of PPVFRA as on July 1, 2017

Sources of Co Financing	**Name of Co-financer**	**Types of Co-financing**	
		Cash (US$)	**In-kind (US$)**
National Government	ICAR and its institutes	19,41,000	10,68,500
International agency	Bioversity International	26,00,000	4,00,000
GEF agency	UNEP	-	1,00,250
NGO	Gramin Vikas Vigyan Samiti (GRAVIS)	1,20,000	80,000
NGO	Lok Chetna Manch (LCM)	-	1,00,000
NGO	Mount Valley Development Association (MVDA)	-	80,000
NGO	Himalayan Research Group (HRG)	50,000	1,00,000
NGO	Action for Social Advancement (ASA)	2,00,000	1,00,000
NGO	Deendayal Research Institute (DRI)	3,00,000	2,50,000
State Govt. Agency	Assam Agriculture University (AAU)	2,20,000	1,60,000
State Govt. Agency	Agriculture University, Jodhpur (AUJ)	3,50,000	1,60,000
State Govt. Agency	CSK Himachal Pradesh Krishi Vishwavidyalaya (CSKHPKV)	2,20,000	1,60,000
State Govt. Agency	Indira Gandhi Krishi Vishavidyalaya (IGKV)	6,00,000	4,25,000
State Govt. Agency	Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya (RVSKV)	6,00,000	4,25,000
	Sub Total	**72,01,000**	**36,08,750**
	Total	**US$ 10,809,750 ***	
* Ten million eight hundred nine thousand seven hundred fifty US$ only			

6. Implementation Issues

21. After sanctioning the project, the 1st GEF Grant was received on Jan 17, 2017 and BI was responsible to manage it. However, the PC (Dr Jai C Rana) joined on Sept. 01, 2017 and established a Project Management Unit (PMU) followed by signing of agreements by the partners on Oct 01, 2017. Between Jan, 17, 2017 to August, 2017, the project was managed by two Project Directors (Drs PN Mathur and Krishna Kumar) on Ad-hoc basis. The work of the project was, thus, actually started from Oct. 01, 2017 after signing of the agreement and release **of funds to the partners, which were**

effected during Nov. 2017 to Feb. 2018 In addition, there are 03 more issues related to implementation that are listed as follows:

6.1 Withdrawal of PPVFRA- a Government of India's (GoI) Regulatory Authority due to Conflict of Interest

22. PPVFRA is a statutory authority for regulating registration, protection, conservation and utilization of plant varieties (identified by the farmers as well as public and private sector both). It turned out at this stage that PPVFRA is a statutory body and therefore, can't be an actor and judge in disputes. Consequently, PPVFRA withdrew as a partner, however, the project continued to work in close collaboration with the PPVFRA.

6.2 Covid-19 Pandemic

23. After passage non 30 months, India faced a global pandemic of Covis-19 virus which led to **complete lock down in the country for 66 days from March 25 to May 31, 2020. Thereafter, work was resumed but at low pace because of restrictions on free movement. India faced 2nd wave of covid-19 again in April 2021 followed by again a nation-wide lockdown for two weeks from April 15, 2021 to June 07, 2021**. March-April are the harvesting period of winter crops followed by preparation for the summer crop. Thus, **project work slowed down considerably during 2020 as well as 2021**. However, the project personnel were so dedicated that they did not allow the two crop seasons to go blank and work hard to deliver the outputs mostly on time and highly satisfactory except in component-2.

6.3 Deletion and Addition of New Sites

24. Two sites *viz.* Phek and Mokukchong in the state of Nagaland were dropped due to inaccessibility after the base line survey and Alami & Niti Valley were added.

SECTION II: REVIEW OF PROGRESS AND IMPACT PERFORMANCE

7. Summary of Project Performance, Progress and Key Deliverables at Mid-term

25. The key findings and deliverables have been divided into two parts (i) dealing with the significant achievements and (ii) detailed component-wise outputs and outcomes, which have been arrived at based on the reviewer's observations in the field, verification from the partners, farmers as well as project staff. Table 4 presents the crops handled by each agro-eco region along with number of potential varieties selected by the farmers through PVS, their multiplication, storage and exchange among the farmers.

Table-4 Agro-eco Regions, States, Sites, Crops, Land Races Selected and Community Seed Banks Established

Sl. No.	Agro-eco-Region	State(s)	Site(s)	No. of Crop-s	Crops handled by each Agro-eco Region	Land races selected #	Community Seed Bank Established #
1	**Hot Arid**	Rajasthan	Jodhpur Jaisalmer Barmer	**8**	Pearl Millet, Moth Bean, Mung Bean, Chickpea, Barley, Mustard, Cumin &Sesame	23	5
2	**Central Tribal**	MP	Jhabua Umaria Satna	**9**	Rice, *Kodo* (*Paspalum* sp.), *Kutki* (*Panicum* sp.), Pigeon pea, Chickpea, Mustard , Amaranth, Black gram & Buckwheat	57	19
		Chhattisgarh	Surguja Koriya				
		UP	Chitarkoot				
3	**North-Western Himalaya**	Uttarakhand	Tadikhet Someshwar Niti Vally Ramanna Bhilangana	**9**	Rice, Finger Millet, Black Soybean, Barley, Horse gram, Mustard, Amaranth, Buckwheat, & Kidney bean,	44	2
		HP	Gohar Vally	**6**	Rice, Barley, Kidney bean, Rice bean, Buckwheat & Amaranth	11	1
		Ladakh	Leh Kargil	**4**	Buckwheat, Kidney bean, Barley & Mustard	02	0
4	**NE Region**	Assam	Dhangdhora Alengmora Alami	**6**	Rice, Mustard (*juncea*, yellow sarson, toria, & white mustard), Black gram, Green gram, Sesame & Pigeon pea	24	2

7.1. Most Significant Achievements:

i. One hundred sixty one (161) varieties identified from 2,762, landraces selected through PVS for the diverse use of farmers is collated below in Table-5:

Table-5: Potential verities selected by the farmer through PVS

Sl No	Crop	No. of Variety		Sl No	Crop	No. of Variety
i.	Rice	74		xi.	Moth Bean	4
ii.	Barley	4		xii.	Mung Bean	7
iii.	Pearl Millet	7		xiii.	Horse gram	2
iv.	Finger Millet	4		xiv.	Black Gram	5
v.	*Paspalum* (*Kodo*)	3		xv.	Check pea	4
vi.	*Panicum* (*Kutki*)	3		xvi.	Pigeon Pea	10
vii.	Buckwheat	3		xvii.	Soybean	2
viii.	Amaranth	8		xviii.	Sesame	4
ix.	Rice Bean	4		xix.	Mustard	4
x.	Kidney Bean	7		xx.	Cumin	2

ii. Twelve (12) product identified for value chain

iii. Market value chain for 09 crops completed many of which are rich in protein, essential amino acids and micronutrients like Fe and Zn

iv. Five (5) products commercialized and new markets established for them

v. Nutritional profiling 635 famers' varieties completed

vi. Five (5) local Seed network established in all the 04 agro-eco-regions

vii. Twenty nine (29) Community seed bank established at 17 project sites

A Community Seed Bank in Western Hot Arid Region

viii. Two thousand five hundred (2,500) native varieties conserved in community seed bank.

ix. Seed Multiplication of 161 farmers' varieties in place

x. Sixteen (16) Community diversity registered at ten project sites

xi. Two hundred ninety eight (298) farmers varieties submitted to PPVFR Authority for registration and certificates for 59 issued

xii. Forty five (45) crop diversity fairs, 149 workshops, 162 field day and 194 famers meet organized at project sites

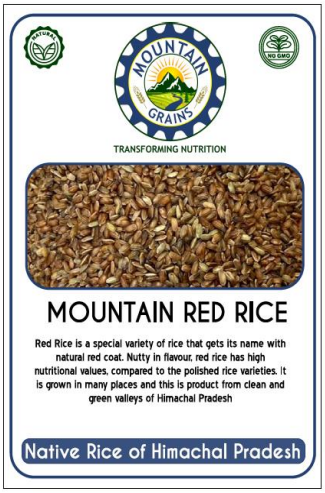
xiii. A strong network of 4 ICAR institutes, 5 SAUs, 8 KVKs & 7 NGOs established.

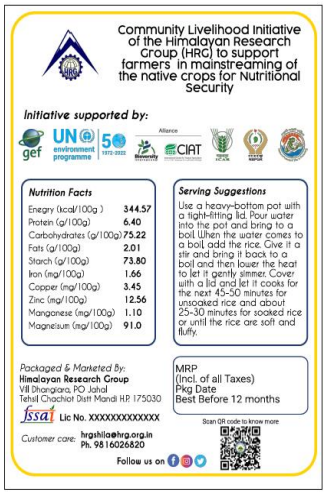
xiv. Six trainings workshops conducted during the operation till Dec, 2020

xv. Potential value added product from nine crop identified and five of them launched as **Native Basket.** Following 05 of them would be launched during the current year of 2021

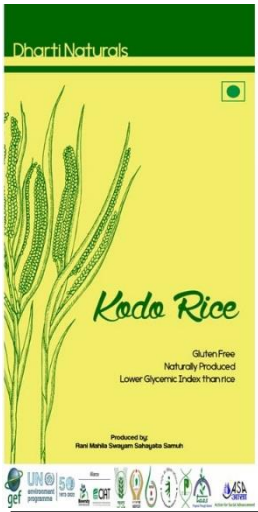
(i) Dharti Natural,
(ii) Mountain Grains
(iii) Hill Haat
(iv) Uttaranjali
(v) Marwari Basket

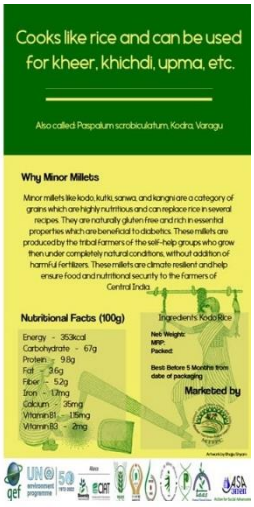
Farmer's Varieties of Rice for Marketing under the Band Name 'NATIVE BASKET'





Red Rice – A Native variety ready for marketing





Kodo (Paspalum Scrobiculatum) ready for marketing

xvi. A National Webinar entitled "Implementation of Access to Plant Genetic Resources and Benefit sharing" with around 200 participants held during 2020

7.2 Output, Outcome and Impact Performance Review as per Mid-Term Target

26. The project comprises of three components for which there are six specific outputs in Component-1, four outputs in Component-2 and three specific outputs in component-3 and they have been planned in such a way that the farmers start getting benefit of this project right from 3rd year of operation. A detailed assessment of progress on the outputs as against the agreed mid-term targets (Table 6; pages 20-34) and consequent attainment of project outcomes (Table 7; pages 35-37) are presented below:

27. During the process, PMU was given an opportunity to self-assess their accomplishments with respect to the targets fixed for the mid-point of the project. And this was verified by the reviewer through various sources like interaction with farmers and the partners in hot arid and N-W Himalayas during reviewer's visit; however, for rest of the Central Tribal and NE region, the information was furnished by one source only through video-conferencing. **In order to distinguish the columns, the mid-term target is presented in RED whereas MTR's comment in GREEN followed by three colored indicators for each output/outcome as follows:**

INDICATORS FOR TARGETS

ACHIEVED ON TARGET TO BE ACHIEVED NOT ON TARGET TO BE ACHIEVED

In addition, there were outputs where even the Mid Term Targets fixed have exceeded. This has been shown by the following sign:

MORE THAN THE TARGET

Apart from the above, explanation for each has been given as foot note(s) at the end of the page and details of measure to be taken to make up the loss.

7.2.1 Review of Status of Outputs: The status of attainment of outputs at mid-term is presented below in Table 6.

Table 6 : Assessment of Progress on Outputs as against the agreed Mid-Term Targets

Component-1. Adaptive Management of Crop Diversity for Resilient Agriculture and Improved Livelihoods						
Output	**Indicators**	**Baseline**	**Mid-term Target**	**PMU's Self- assessment**	**MTR Comment**	**MTR Rating**
1.1 Extent and distribution of genetic diversity of 20 crops in 4 agro- eco-regions determined, together with documentation of factors that shape farmer decisions on diversity maintenance, including challenges presented by climate change	Data, disaggregated by gender, on socio-economic-cultural and environmental factors influencing the choice and distribution of crops and cultivars including associated traditional knowledge documented in all project sites by year5	No systematic information on extent and distribution of genetic diversity or documentation of factors influencing farmer decisions on diversity maintenance across the project sites	Baseline situational analysis of extent and distribution of crop diversity on farmin4agro-eco regions completed	Baseline survey in four agro-ecological focus regions of the project using the RHoMIS (Rural Household Multiple Indicator Survey) was completed for characterization of farm livelihoods in four contrasting agro-ecological zones in India and assessment of key pathways towards diverse diets in the four zones. Total number of household surveys analysed in this report was 1,698. Our results showed that the agro-ecological zones included in the project are very different: strong differences in farming systems and livelihood strategies, and in pathways towards diverse diets. The	**Baseline situational analysis and extent of distribution of biodiversity completed. RHoMIS survey indicate existing level of diversity in crops being cultivated by the farmers in 4 agro-eco regions along with their dietary diversity. This clearly indicates the entry points for improving the diets of the people in the 4 agro-eco regions.** **ACHIEVED**	**HS**

				food group-based analyses of dietary diversity scores gave good insight in existing diets, and potentials for and types of interventions that could help improving these diets. For example, in the Western Himalayan zone cereals, legumes and different groups of vegetables are already present in diets with relatively low dietary diversity scores, while livestock products only come in at high dietary diversity scores. This shows that basically the whole population surveyed has diets that consist of at least 4 or 5 crop and vegetable-based food groups. This is quite distinct from the other zones, where dairy is one of the key components of the diets of the large majority of households (it comes in as either the second or third food group in the diets), stressing the higher importance of livestock in		

				those production systems. The food group breakdown of the dietary diversity scores can give important information for intervention planning to improve the current diets. For example, in the Hot Arid region the average dietary diversity score lies around 4, and at that level of dietary diversity leafy vegetables and eggs have not entered the diets yet. These two food groups could therefore be the entry point for diversification strategies in that zone. For the Central Plateau zone similarly fruits and eggs could be focus points of interventions. This report is a first step in analysing the household survey data, but it gives valuable insights and generated hypotheses that need further testing in field-based research and further in-depth data analyses. It is clear that both should go hand-in-		

				hand to achieve a robust evaluation of these initial findings.		
1.2 New and traditional crop genetic diversity meeting farmers' needs and able to enhance ecosystem function, resilience and adaptation to climate change identified and made available	Farmer needs documented by gender and most promising diversity identified for all project sites Seed production and availability adequate for all project sites	No information available on farmer needs or adaptive crop diversity of target crops needed for climate change conditions Seed of traditional and new varieties insufficient for on farm experimentation	Diversity needs identified for at least 14 project sites for all target crops	Based in the baseline survey diversity needs such *as peeli bajri, moonch wali bajri* of peral millet and *Jadhia moth* (moth bean) in Rajasthan, red rice and red capsule type common bean in hills, naked barley in central, western and arid region, *telia* and *doodh monger* in Jhabua, etc. were identified by the farmers. As a result, 2,762 landraces and farmers' varieties of 20 food crops were evaluated through a participatory varietal selection approach at farmers' field to select varieties for various climate conditions. To date, farmers have identified 161 varieties of different crops as the most potential varieties suitable to their diverse needs. To date, farmers have identified 161 varieties of	**Diversity needs identified for twenty crops for 18 sites. 161 varieties identified from 2,762 farmers' traditional varieties evaluated through farmers' participatory varietal selection (PVS) approach** **ACHIEVED**	**HS**

			Seed multiplication plots established	different crops as the most potential varieties suitable to their diverse needs. All the varieties have been put under large scale seed multiplication and seed multiplication plots have been established at all sites.	**Seed multiplication of all the 161 potential varieties of different crops in seed multiplication plots have been established which will result in large scale seed production of these varieties from 2021 onwards.** **> THAN THE TARGET ACHIEVED**	
1.3 Farmer identification, improvement and use of adaptive crop diversity through field experimental networks	New adapted crop diversity tested and introduced by farming communities, using participatory approaches, identified across all project sites.	No such adapted crop diversity identified and limited PVS/PPB programs exist in the country, especially across the our project sites.	At least one PPB/Participa t-ory Variety Selection (PVS) program per crop (20) in two agro-eco-regions.	A total of 2,762 farmers' varieties of 20 crops were tested in 549 participatory variety selection (Mother) trials and 4,304 baby trials, using Tricot methodology across project sites. Four training workshops on protocol for undertaking Participatory Variety Selection and crowdsourcing farmers' field trials have been organized for project partners. A set of farmers' evaluation descriptors was identified, and farmers' evaluation field book in the local languages that help farmers in participatory selection and breeding was	One hundred sixty one (161) varieties of 20 crops selected through PVS with crop-wise details: **Rice-74** **Pearl millet-07** **Finger millet -04** ***Paspalum* (*kodo*)-02** ***Panicum* (*kutki*)-03** **Amaranth-08** **Buckwheat-03** **Barley-04** **Pigeon pea-10** **Chickpea -04** **Kidney bean-07** **Rice bean-04** **Black gram -05** **Green gram- 07** **Horse gram -02** **Moth bean- 04**	HS

			At least two new crop varieties (20 crops) adapted to climate change and being used in at least 6 project sites.	designed and was distributed A total of 161 varieties of 20 crops were identified as most potential, adopted and suitable to farmers diverse needs have been identified in 17 project sites.	**Soybean-02** **Sesame-04** **Mustard-04** **Cumin-02** **At least 4 to 5 landrace of rice, barley, Kidney bean, Mung Bean, Urd Bean, Moth Bean, Check pea , pigeon pea, Mustard and Amaranth are being grown across 10 project sites** **ACHIEVED**	
1.4 Improved farmers' access to genetic materials in all project sites through establishment of community biodiversity registers(CBRs), community seed banks (CSBs), and diversity fairs	Numbers and/or distribution of new and traditional crop varieties have improved as measured by richness and evenness data in each project site.	Concept of community biodiversity management approaches (including CBR, CSB and diversity fairs) to enhance on-farm crop diversity is relatively new and not fully operating.	Community biodiversity Registers established in at least 10 project sites. Crop diversity fairs organized in at least 10 project sites.	Sixteen community biodiversity registers have been established in at 11 project sites Forty five crop diversity fairs organized at 17 project sites wherein 1787 farmers comprising 1,157 male and 630 female farmers were participated	**Sixteen community biodiversity registers established at 11 sites.** **Forty five crop diversity fairs organized at 17 project sites. 1,787 attended** **> THAN THE TARGET** **ACHIEVED**	**HS**

	Community biodiversity management approaches (CBR, CSB, diversity fairs) established to strengthen local seed systems and exchange networks.	Local seed production and exchange systems are weak.	Community seed banks established in at least 10 project sites. Local seed production and exchange networks developed in at least 10 project sites including relevant seed production training workshops.	To strengthen the local seed production and exchange systems seed is being exchanged through 29 community seed banks that have been established at 17 project sites are conserving >2500 native varieties Local seed networks at all 18 project sites involving 139 Self Help Groups, 11 farmers' producer organization, 8 KVKS and 7 NGOs have been established.	**29 community seed banks established at 17 sites established** **> THAN THE TARGET** **ACHIEVED** **Local seed networks established at 18 project sites. Farmers trained in seed production** **> THAN THE TARGET** **ACHIEVED**	
1.5 Production and non- market benefits/incentives from management and sustainable use of crop genetic diversity of 14 crops in four agro- eco-regions by farming communities identified and relevant intervention strategies	Production and non-market benefits from sustainable use of crop diversity well defined and potential benefits described at all project sites	Limited description and quantification of production and non-market benefits/ incentives from sustainable management and use of crop diversity at local and national level	A potential set of production and non- market benefits as well as potential incentive mechanisms for their capture and enhancement identified at all project sites	Potential products that have production and non-market benefits as well as potential incentive mechanisms have been identified for all sites. Products are expected to launch by the end of this year at almost all sites. It has already been identified at few sites and launched such as native basket in Assam and *Jeeraphool* in Chhattisgarh	**A set of production as well as non-market benefits and incentive mechanism identified for all the sites for more than 5 crops. Food crops will help in reducing hunger, legumes will improve nutrition. Application of lower level of**	S

for capturing and enhancing such benefits developed			Documentation of nutritional value (including knowledge on food, culture and recipes) developed for all crops across at 10 project sites Farming models promoting crop diversity and responsible agriculture for sustainability of the ecosystem are demonstrated at 10 sites	A total of 635 varieties have been nutritionally profiled for further upscaling and 26 products that have market potential haven identified. Also, 111 local product including knowledge on food culture and recipes have been documented at all project sites. Majority of the native crops and varieties are being grown under natural farming e.g. all native varieties of all 20 crops are being grown under natural farming as means of responsible agriculture for sustainability of the ecosystems	**chemical inputs will reduce pollution.** **Although nutritional attributes of 635 traditional varieties done but it needs to be REPEATED and CONFIRMED By A THIRD PARTY DURING THE EXTENDED PERIOD** **Natural Farming models for the traditional varieties of all the cereals, pseudo-cereals, legumes, oilseed and spices identified and demonstrated at 12 sites by the project. ACHIEVED**	
1.6 Local, regional and national markets identified and market chains developed for 14 crops to provide improved benefits to farmers and	At least 10 high value products, including those with high nutritional value, identified from improved use of crop diversity by year5	Formal marketing opportunities for house hold/ community level products are limited and even these do not specifically	Market chain analysis for all 20 crops carried out in 4 agro-eco-regions	Market value chain analysis has been done for all the 20 crops and for few crops such as rice, amaranth and millets it has been completed and launched. Products are being sold under brands such as	**After completing the market value chain for 14 crops, five products have already been launched in rice as '*Native Basket*', while a few more *viz. Dhartee Natural***	**S**

communities in all project sites for sustainably produced agricultural biodiversity products		recognize crop diversity value of products or their ecosystem sustainability properties	Potential value- added products from at least 6 target crops for sale in local, regional or national markets	***Native basket***, ***Dhartee natural***, ***Jeera phool*** while few like ***Sahalee, Mountain Grains, Hill Hatt***, etc, are expected to launch in 2021. A total of 12 products of 09 crops have been identified for value chain at all project sites. For example, 24 heritage rice varieties identified and selected, after nutritional profiling, for revival across Assam under the Native Basket brand. Another value chain has been developed to *Jeera phool* aromatic rice of Chhattisgarh. Native varieties of red rice, kidney bean, black gram, chickpea, moth bean, mustard, barley, pigeon pea and pearl millet have been identified and are being under large scale seed production.	***Marwari basket, Mountain Grains, Hill Hat & Uttaranjal*i are expected to be launched during later part of 2021.** **Twelve potential value added products in respect to NINE crops identified and developed. Some of them have already been launched as *NATIVE BASKET* while few more *viz. Marwari basket, Mountain Grains, Hill Hat & Uttaranjal*i are expected to be launched in 2021. for marketing at local, regional as well as at national level-** **ACHIEVED** **> THAN THE TARGET**	

Component-2. Strategies and Policies for Sustainable Conservation and use of Crop Diversity including Access and Benefit Sharing						
Output	**Indicators**	**Base Line**	**Mid-Term Target**	**PMU's Self-assessment**	**MTR's Comments**	MTR Rating
2.1 National and regional policy platforms, including involvement of ministries, local communities, indigenous organizations, farmers, private sector, to promote leadership and mainstreaming of agricultural biodiversity conservation and use including ABS established and implemented	Institutional mechanisms, that are gender inclusive, for linking different sectors and actors are identified and implemented nationally andin4 agro- eco-regions	No such mechanisms or platforms are currently in place	Institutional mechanisms, that are gender inclusive, for linking different sectors and actors are identified and national platform is established and implemented	To have in-depth analysis of policy platform a National Webinar on "Implementation of Access to Plant Genetic Resources and Benefit Sharing (ABS)" was held on August 27, 2020 involving ministries, local communities, indigenous organizations, farmers, private sector. The webinar was attended by 200 stakeholders as stated above. More such events at national and regional level involving farmers will be organized in the coming years.	**Although efforts have been made by the project team to create institutional mechanism; more efforts are required to identify the actors in different sectors to create a gender inclusive platform at NATIONAL LEVEL.** **NOT ON TARGET TO BE ACHIEVED**	**MU**
2.2 Analyses of public policies, relevant instruments and regulations undertaken and gaps identified and incentives for improved sustainable use and conservation of agricultural biodiversity including provisions	Policy guidelines and recommendations that provide incentives to conserve, use and share benefits of crop diversity are developed and under consideration by year five	No such guidelines exist or are currently limited. There are national guidelines or mechanisms that promote conservation of crop diversity and sharing of genetic	Existing policies and regulations and their impact on the conservation and use of crop diversity analyzed	The analysis of existing policies and regulations and their impact on the conservation and use of crop diversity have been done and a draft document is under preparation.	**Analysis of the existing policies & regulations and their impact on conservation and use of biodiversity has been completed and the document emanating from**	M S

-----: ABS is a complex process and needs wider consultation which were not held in first (due to delay start of the project) and second year (because of field work resulting in very low level of coordination and implementation.

and opportunities for improved access and benefit sharing recommended		resou rces by farmers and communities, but they are under different Ministries and not well coordinated; no policy guidelines that enhance the use of crop diversity for climate change adaption and house hold food and nutrition security	Challenges and opportunities for improving the policy environment determined and policy recommendation s and guidelines drafted	Challenges and opportunities for improving the policy environment have been deliberated in the national webinar and policy recommendations drafted in the proceedings of the Webinar.	**this is under preparation. It is hoped that the challenges and opportunities for improving policy environment will be addressed effectively.** **ON TARGET TO BE ACHIEVED**	
2.3 Model agreements that regulate access and benefit sharing with farmers communities and which recognize the core principles of Access and Benefit Sharing (ABS)established	Access and benefit sharing agreements that incorporate Free, Prior Informed Consent and mutually agreed terms developed and implemented wit hat least 10 signed agreements with farmer communities across the project sites' Unique farmer varieties' are registered with Protection of Plant Varieties and Farmers' Rights	There is currently limited implementation of the core principles of ABS and consequently little recognition of the benefits from conservation and use of crop diversity (among farmers in project sites) With the exception of rice very few unique farmers' varieties registered with PPV&FRA	Advocacy workshops are carried out in all project sites to raise awareness among local institutions, communities, including indigenous groups, and farmers' rights and benefits on crop diversity they conserve and manage. At least 50 unique	To recognize the core principles of Access and Benefit Sharing (ABS) and to raise awareness and enhance knowledge farmers' and local communities, NGOs, local institutions, outreach and research staff and senior officials from relevant ministries 149 workshops were organized, wherein 11,366 framers comprising 7,062 men and 4,303 women and participated. So far, 298 farmers' varieties have been identified and submitted	**149 workshops organized at all the project sites to raise awareness among local institutions, indigenous groups and farming communities about importance of conserving and utilizing crop biodiversity which will result in ABS.** **A large no. of people have been sensitized and its benefit will be visible in coming years.** **The project team has submitted 298**	M S

-----: The document is ready and will be discussed with relevant authorities during 2021

	Authority (PPV&FRA) and benefits are flowing to communities in project sites		farmers varieties' are identified from across all project sites for registration with PPV&FRA	for registration with PPV&FRA.	**farmers' varieties for registration to PPVFRA which has issued Registration Certificates for 59 of them.** **ON TARGET TO BE ACHIEVED**	
2.4 National and regional strategies and plans on integrated sustainable agricultural improvement, use and benefit sharing of agricultural biodiversity developed and supported by implementation programs of work	A national and 4 regional inclusive strategies and action plans for integrated sustainable agriculture using crop diversity developed and implemented by the end of the project	No specific strategy that supports integrated, sustainable and resilient agriculture using local crop genetic diversity developed	National strategy and action plan for integrated sustainable agriculture using crop diversity drafted and under consideration. Draft regional strategies and plans based on project findings prepared	National and regional seminars to draft national strategy and action plan for integrated sustainable agriculture using crop diversity including based on project findings will be organized in the subsequent years when we have complete results in hand and also COVID free movement to sites will be there	**The project could not organize national and regional seminars to evolve a National Strategy and action plan to integrated sustainable agriculture using crop biodiversity due to restrictions on movement and National Lock down. It's expected that the draft will be prepared during the extended period** **NOT ON TARGET**	**YET TO START**

-----: Registration with PPVFRA will be done after completion of DUS testing during 2020- 22

-----: National and regional seminars NOT organized presumably due to restriction on travel and meeting during COVID 19 pandemic by GoI, proposed to be organized during 2021-22

Component-3. Improved Agricultural Support Systems, Institutional Frameworks and Partnerships that Support Crop Diversity on Farm						
Output	**Indicators**	**Base Line**	**Mid-Term Target**	**PMU's Self-assessment**	**MTR's Comments**	MTR Rating
3.1 One national and eight regional level awareness raising campaigns on the value of agricultural biodiversity; its maintenance and use for resilient agriculture organized for different stake holder groups including farmers, government ministries and agencies, policy makers, researchers, extension workers, teachers and consumers	Increased number of farmers, extension workers and policy makers with enhanced awareness of the role of crop diversity for sustainable agriculture production and environment protection	Awareness of the importance of crop diversity in agricultural development in general and rural development in particular is limited and rarely figures in relevant documents, strategies, plans and policy briefings other than crop improvement	Strategy developed for awareness raising campaigns covering all project sites. Awareness campaigns for different stakeholders organized and implemented in at least 12 project sites	To raise awareness and enhance knowledge farmers' and local communities, NGOs, local institutions, outreach and research staff 149 workshops, 162 field days, 194 farmers meeting have been organized at all project sites.	**The project organised a large numbers of effective awareness raising campaigns *viz.* 149 workshops, 162 field days and 194 farmers meet at all the project sites- ACHIEVED** MORE TGAN THE TARGET	**HS**
3.2 Enhanced capacities of researchers, extension and outreach staff, farming communities and local institutions in selecting and deploying	At least 1,000 researchers, extension and outreach staff from government and non- government organizations and farmers in 22 project	Few researchers and extension and outreach staff with training in participatory research methods or community	Need assessment completed and training programs designed and	Need assessment on various trainings have been identified and trainings such on make use of IT tools such as mobile apps developed by project partners in 3 sites, ClimMob software	**Having completed the need assessment; 11,366 (6870 male and 4,723 women farmers) and a large numbers of researchers from SAUs, KVKs and line**	**HS**

adapted crop diversity through participatory approaches	sites trained in participatory approaches and community biodiversity management (CBM) to better deploy crop diversity At least 50% of those trained by the project apply new skills Number of female and outreach staff trained researchers, extension	biodiversity management working with farmers directly Farmers' contribution to research is limited to hosting of on-farm testing plots or demonstration plots with no decision making roles	delivered in 12 project sites	for conducting crowdsourcing trials and ODK Collect based server for better big data management, Value chain development, use of GIS and agro-biodiversity conservation and use and on various ABS issues have been organized. More will be organized in the subsequent years of project.	**departments have been trained at all the project sites in collaboration with the partners of the project. This will help in mainstreaming of agricultural biodiversity.** **ACHIEVED**	

3.3 Improved research programs which support mainstreaming of agricultural biodiversity and its improved use to support ecosystem function, resilience and adaptability activities are in place	Innovative, gender sensitive, interdisciplinary and participatory research programs and proposals that facilitate improved use of crop diversity to support ecosystem function, resilience and adaptation	Relevant research programs and proposals that facilitate improved use of crop diversity including selection from farmer fields and linking farmers to national gene bank are few or non-existent and seldom interdisciplinary	Improved use of crop diversity to support ecosystem function, resilience and adaptation is promoted to be recognized as a key research area by relevant national research supporting bodies	For improved use of crop diversity to support ecosystem function, resilience and adaptation to be recognized as a key research area network involving 4 ICAR institutes, 5 State Agriculture Universities, 7 NGOs, 8 KVKs, 26 Biodiversity Management Committees, 139 Self-Help Groups, 25 Farmers Producer Groups, 20 private companies has been established at the project sites. All the members of the network have been trained to better deploy and mobilize crop diversity for improved adaptation, ecosystem functions and livelihoods. More institutions from NARS will be involved and trained in the subsequent years.	**In close collaboration and partnership of 04 ICAR institutes, 05 SAUs, 08 KVKs, 07 NGOs, 26 biodiversity management committees, 139 SHGs, 25 farmers produce groups and 20 private companies, the project has demonstrated that maintenance and deployment crop biodiversity is key to support ecosystem function and adaptation to climate change and most importantly livelihood of the small and marginal farmers.** **ACHIEVED**	**HS**

7.2.2 Review of Status of Outcomes: The status of Attainment of outcomes at mid-term is presented below in Table 7`

Table -7: Statues of accomplishments of Project Outcomes at Mid-Term

OUTCOME-1	INDICATOR	BASE LINE	MID-TERM TARGET	ACHIEVEMENT AT MID-TERM	MTR Ranking
1. Farmers (at least 10,000) across four agro- eco-regions covering 50,000 ha in India maintain and use an increased availability to diversity of 14 crops which enhances adaptation, resilience and improves income generation opportunities	1.1 Strengthened seed systems in terms of numbers and types of exchanges of relevant crop diversity within and between project sites and other areas 1.2 Areas adapting crop biodiversity practices identified as sustainable and resilient 1.3 Income levels of farmers (female and male) in project sites based on increased returns, reduced input costs or improved efficiencies in production	Although informal local seed networks exist, these function poorly and rarely ensure that crop diversity available across all project sites is sufficient to meet challenges posed by climate uncertainty or potential market opportunities	At least 3 local seed networks linked to 5-6 community seed banks (CSBs) to improve farmers access to crop diversity in the 4 agro-eco-regions to traditional and other varieties of 14 crops At least 10% increase in number of varieties used by at least 20% of households across 10 project sites	Five local seed networks in all the four agro-eco regions involving 139 Self Help Groups and 11 farmers' producer organization established for 20 crops. Seeds are being exchanged through 29 CSBs that have been established at 17 project sites conserving >2,500 native varieties. At least 10% increase in number of land races used by at least 20% farm household. Presently, the area under potential varieties is around 15,000 ha and expected to expand to 65,000 ha by 2022 by involving ~ 27,000 farmers. Income level of farmers in NE & CT regions increased but yet,to be quantified **ACHIEVED** **MORE THAN THE TARGET**	**HS**
			New markets identified for targeted crop diversity	New markets for five native varieties of rice *viz*. *Kola Joha, Boga Betguti, Amona Bao, Ronga Bao* (out of 24 heritage rice varieties) in NE Region and one viz. *Jeera Phool in* CT Region have been identified in the local and regional markets. The 1st four are being marketed under the brand	**HS**

				Native Basket. Armed with a brand name, the aromatic rice commands up to 25% higher premium. Over 2,000 farmer families will be benefiting the whole gamut of activity from production to processing and sale in NE Region Value chain of *Jeera phool, an* aromatic rice of Chhattisgarh is another success story. The women self-help groups are striding ahead with their success, linking up with companies and Govt. offices. The farmers have more than trebled (cf.2015) its cultivation to 400 hectares harvesting over 1,000 tonnes in 2020 in Surguja district in central plateau region. Export opportunities are also being explored **ACHIEVED**	

OUTCOME- 2	**INDICATOR**	**BASE LINE**	**MID-TERM TARGET**	**ACHIEVEMENT AT MID-TERM**	MTR Ranking
2 Mechanisms for improved coordination and implementation to promote better mainstreaming of conservation, use and sharing of crop diversity	2.1 National Biodiversity Action Plan (NBAP) and Farmer's Rights legislation clearly reflects the need for increased use of crop diversity to enhance ecosystem services and benefits and livelihoods and incomes of farmers	National Biodiversity Action Plan (NBAP) and Farmer's Rights legislation does not fully recognize the potential of crop diversity in	Review of National Biodiversity Action Plan (NBAP) and Farmers' Rights legislation in collaboration with PPV&FRA be completed at the national level and linked to project in pilot sites	The review of NBAP and Farmers' Right has **not been completed** because of restrictions on travel and physical presence in meetings due to Covid-19's pandemic. However, **a National Webinar on "Implementation of Access to Plant Genetic Resources and Benefit Sharing (ABS)" was held on August 27, 2020 with 200 stakeholders**. This document provides briefly the deliberations during	**MS**

developed and supported by relevant policy instruments, regulations, strategies and plans including access and benefit sharing		income generation and in providing ecosystem benefits		the meeting and its recommendations. For the management of biological resources at community level, 26 BMCs have also been formed and made aware of the provisions of the BDA while accessing the biological resources. **NOT ON TARGET** **TO BE UNDERTAKEN during 2021-22**	

OUTCOME-3	**INDICATORS**	**BASE LINE**	**MID-TERM TARGET**	**ACHIEVEMENT AT MID-TERM**	MTR Ranking
3 Improved Agricultural Support Systems (Research, Outreach and Extension), Institutional Frameworks and Partnerships at national, regional and local levels to ensure improved agricultural biodiversity conservation, adaptability, resilience and farmer livelihoods	3.1 National, regional and local level agricultural support systems, institutional frameworks and partnerships, that are gender sensitive, improve crop diversity conservation and use	Limited agricultural support systems, institutional frameworks and partnerships to ensure improved crop diversity conservation, use for adaptability, resilience and farmer livelihoods in marginal areas	Major elements for strategy guidelines for improved national, regional and local agricultural support systems and institutional frameworks, that are gender sensitive, to support the mainstreaming of crop diversity are identified and policies relevant to the maintenance and use of crop diversity reviewed	A network involving four ICAR institutes, five SAUs, seven NGOs, eight KVKs, twenty six Biodiversity Management Committees (BMCs), one hundred thirty nine Self-Help Groups (SHGs), twenty five Farmers Producer Groups and twenty private companies has been established at the project sites. Eleven thousand three hundred and sixty six farmer members (7,062 men and 4,304 women farmers) and officials of the network have been trained to better deploy and mobilize crop diversity for improved adaptation and livelihoods. Major elements of strategy guidelines for improved national, regional, and local agricultural support systems that are gender sensitive, to support the mainstreaming of crop diversity, are further being identified and reviewed. **ACHIEVED** **MORE THAN THE TARGET**	**HS**

7.2.3 Review of Impact Performance

28. The full scale impact (of the project) will although become available towards the end of the project; yet, early signs of impact performance appear to be very encouraging as evidenced by the interest shown by all the stakeholders specially farmers who actively participated in the project and decided to grow the land races, which are generally low yielding as compared to modern varieties of these crops. This reflects their interest in mainstreaming crop biodiversity around them. Coupled with this, the RHoMIS (Rural Household Multiple Indicator Survey) indicated farm livelihoods in four contrasting agro-ecological zones. The assessment of key pathways towards diverse diets in the four zones showed entry points for diversifying the dietary needs in four zones by adopting, maintaining and promoting crop biodiversity. Thus, the project has been able to convince the farmers in the four selected zones of the importance of existing, lost as well as new biodiversity of crops.

29. The selection of 161 farmers' varieties of different crops through PVS shows keen interest of the farmers across four zones in maintaining and promoting biodiversity. With establishment of local seed network, creating facilities for seed multiplication, storage and exchange (of seeds of farmers' varieties), the project has been successful in convincing the farmers of the hidden potential in not only meeting their food and nutrition requirements but augmenting the potential of their livelihoods too. Twenty nine Community Seed Banks set up by the project has made a beginning of having lasting impact in nurturing biodiversity across the four agro-eco regions. This has, in addition, ensured at least 10% increase in number of land races used by at least 20% farm household. Presently, the area under potential varieties is around 15,000 ha and expected to expand to reach around 65,000 ha by 2022 with involvement of around twenty seven thousand (27,000) farmers.

30. Use of land races requires low level of chemical fertilizers as well as pesticides resulting in lowering the cost of cultivation per unit area on one hand and the premium price offered to the produce enhances net profit on the other. This has helped in farmers' understanding of advantages of reverting back to the age-old farmers' varieties. Climate resilience of these land races are yet other attribute that has impacted farmers' decision to use them and this will rise further with passage of time as farmers experience the benefit of biotic and abiotic stress tolerance inherent in these land races.

31. Identification of 12 products for market value chain and launching of the five native rice varieties (four in NE region as **Native Basket** and one in CT region) has instilled tremendous confidence among the farmers of the success of the project in promoting market value chains of other crops too. Establishment of FPOs by the project has laid foundation for harnessing the strength of the association of researchers, farmers, NGOs and more importantly governments in augmenting livelihood support through enhanced income and employment generation. The momentum, however, got a setback from the slow pace of development in component-2 on ABS. But it is hoped that this setback is temporary and the project would make up the loss through

accelerated efforts in near future. Establishing a successful partnership of institutions (four ICAR institutes, five SAUs, eight Farm Science Centres (KVKs) and seven NGOs with a common goal of mainstreaming the conservation and use of agricultural biodiversity for resilient agriculture and sustainable production to improve livelihoods and access and benefit sharing. This association will go a long way in not only fulfilling the targets of outputs and outcomes but ensuring sustainability of the project after its completion.

32. The successful operation of the project till the mid-term demonstrate a new paradigm in harnessing the benefits of collecting, conserving and utilizing crop biodiversity for promoting not only food, nutrition and well-being of the farmers living around the rich biodiversity but improving their livelihoods specially income. After sorting out the complicated issue of ABS and developing a model, the project will further strengthen the trust of the farmers. In absence of the project, it would not have been possible to make such a concerted effort to involve the farmers in mainstreaming biodiversity in rather disadvantaged four agro-eco regions of India. Therefore, the project has made an impressive impact till mid-term after which it will depend on the time given to the project for continued execution for attaining all the objectives at the end of the project as per Result Framework given in ProDoc.

8. Review against other Criteria

8.1 Strategic Relevance

8.1.1. Alignment to the UNEP Medium Term Strategy (MTS), Program of Work (POW) and Strategic Priorities

33. The reviewer has gone through the MTS of UNEP (2018-21) as well as POW and find that project is aligned with the major objectives of MTS (2018-21) and focuses on developing and promoting environment-friendly agricultural technology that will reduce application of agrochemicals including mineral fertilizers thus reducing, river, fresh water, land and air pollution due to leaching of nutrients and emission of greenhouse gases.

34. Agriculture is a dominant source of air pollution in the world. Livestock account for about 40% of global emission, mineral fertilizer for 16% and biomass burning of crop residue for about 18%. The Regional priority is Asia, sub-regional in south Asia and national in India is to reduce pollution from agriculture through reduction in application of mineral fertilizers. In northern India, farmers apply heavy doses of nitrogenous fertilizers, thereby increasing emission of nitrogen oxides and methane with potential global warming. The traditional farmers' varieties and land races are tall and require less nitrogenous fertilizers. Thus, if farmers cultivate elite land races with unique characters that help in attraction premium prices, the application of mineral fertilizer will slowly be reduced which will, in turn, reduce ground water pollution due to leaching of mineral fertilizers and agricultural chemical like pesticides used by the farmers.

8.1.2. Alignment to Donor/Partner's Strategic Priorities

35. The project is fully aligned with the priorities of the donor (GEF/UNEP) for developing technology that are environmentally sound as for example, the identification followed by cultivation of the elite land races of different crops will help in reducing application of mineral fertilizers excess application of which not only pollutes ground water as well rivers but aids to global warming because of release of greenhouse gases to the atmosphere.

8.1.3 Relevance to Global, Regional, Sub-regional and National Environmental Priorities

36. The project is aligned with global, regional, sub-regional as well as national priorities set by India with special reference to reducing pollution of ground water, rivers, land and air from agriculture. The UNEP's medium term strategies emphasize addressing Sustainable Development Goals (SDGs) by 2030. The current project partially meets 09 of them *viz*. SDG-1; SDG- 2, SDG-3, SDG-5, SDG-10, SDG-12, SDG-13, SDG-14 &SDG-15 out of 17 Sustainable SDGs. In addition, the results of the project will help in strengthening South-South Co-operation (S-SC) in the field of agriculture as these will directly applicable to the developing countries, which are looking for low input-high output technology in agriculture. The results of the project on identification of elite farmers' varieties and their value chain development will prepare ground work for export of these products, thus, leading to higher profit and popularity.

8.1.4. Complementarity with Existing Interventions/Coherence

37. There exists complete complementarity with the existing practices followed/advocated by the Federal and state governments involved in the project. In fact government has been appealing to the stakeholders in agriculture to increase the input use efficiency of nutrients as well as of pesticides. Thus, there exists no contradiction

8.2. Effectiveness

8.2.1. Availability of Outputs: Quality and Quantity

38. The availability of outputs were mostly on time (except in component-2), and the quality as well as quantity were satisfactory (S) in Component-1 and Component-3. There were, however, very slow progress in Component-2, which involves extensive meetings and consultations that were adversely affected by Covid-19's pandemic in India during 2020-21.

39. The outputs were of immense use of the farmers, who started getting benefit in terms of increased income from sale/marketing of the produce identified as 'Elite Farmers' Variety right from 3rd year of the project. However, the speed of work was hampered due to Covid-19's pandemic. Meanwhile, the project used this period to do the groundwork for launching the value added produce of the farmers' *viz*. four varieties of rice in NE Region and one in Central Tribal Region (CTR) with decent packaging that must be improved further in due course.

8.2.2. Achievement of Planned Project Outcomes

40. The planned outcomes with respect to Component-1 and Component-3 have been highly satisfactory, however, outcome under Component-2 is Moderately Satisfactory as described in Table 7 on pages 35-37.

8.2.3. Likelihood of Impact

41. The outputs and outcome so far indicate that the project will have lasting impact on conservation and utilization of the elite land races of the 20 crops owing to several desirable attributes that attract premium price for their produce. It also indicates inclination of general public preferring the land races of these varieties because of negligible presence of agrochemicals that are generally applied to the HYVs recommended in their package of practices. Today, the farmer is not interested in higher yield but the net profit he gets in case of cultivation of the elite land races. Consequently, the farmers are eagerly looking forward to establishment of value chain in crops other than HYV rice. And there exists huge scope in case of kidney bean, *Paspalum sp (Kodo)*, *Panicum sp (Kutki)*, pearl millet, barley, buckwheat, amaranth, rice bean, Sesamum, chick pea and unique varieties of mustard. There appear to be no negative impact on the women and disadvantaged section of the society including those living with disabilities.

42. The project's output in branding the produce and linking them to market will go a long way in increasing the demand and thus it will encourage lager number of farmers to adopt cultivation of the land races.

8.3. Financial Management

8.3.1 GEF Trust Fund

43. Overall expenditure under the project for the last 4 years *viz.* Jan 2017-Dec 2017; Jan 2018-Dec 2018, Jan 2019-Dec 2019; Jan 2020-Dec.2020 is US$ 1,684,290 (for details see **ANNEXURE-I**) which comes to around 55%. This was mainly because the project started with receipt of 1st GEF grant in Jan 2017; however, the Project Director joined in Sept. 2017 followed by signing of the contract by the partners etc. Thus, the expenditure was low in the 1st year, which picked up in the 2nd year but because of pandemic of Covid-19 and travel restrictions, it was again slowed down during the 4th year (2020). Total allocation and consolidated year-wise expenditure is presented in Table 5:

44. Table 5.Total Budget and Year-wise Expenditure under the GEF Trust Fund

UNEP Approved Total Budget US$	Expenditure during 2017 to 2020 in US$				
	1 Jan,'2017-31 Dec2017	1 Jan.2018 - 31 Dec 2018	1 Jan. 2019 - 31Dec2019	1 Jan.2020 - 31 Dec. 2020	Cumulative Expenditure
3,046,346	**180,166**	**401,847**	**584,579**	**517,698**	**1,684,290**

45. Since year-wise and item-wise allocation was not available with the PMU, the reviewer had to rely on total allocation and year-wise expenditure, which shows very low expenditure during the 1st year (Jan –Dec 2017), thereafter it picked up but apparently due to Covid pandemic and travel restrictions during 2020; expenditure related to travel and meetings could not be used fully. Yet, the project staff did commendable work even during the pandemic.

46. A perusal of item-wise expenditure during the last 3 years (Jan. 2017-Dec. 2020) shows that the expenditure has been slow some budget head, and therefore, a significant amount (nearly 50%) is left unutilized; yet we also learned that many of the outputs have already been completed or even surpassed what was planned, which shows the excellent work being conducted by the team and at low cost levels. Table 5 presents the compilation of the budget heads in which rate of expenditure was slow. Major concern is the following budget lines: 2206, 3205, 3302, 3303, 3304, 3305, 3306 and 3307 which are mainly related to meetings, travel and strengthening of community institutions collated in Table 6.

47. Table 6. Cumulative Unspent amount in selected Budget Line(s) on Dec. 31, 2020

UNEP Budget Line(s)		Total Budget in the Budget Line	Cumulative Expenditure till 31.12.2020 under the Budget Line	Cumulative unspent balance till 31.12.2020 under the Budget Line
2203	Market and non-market benefits for sustainable use of crop diversity	104,500	56,192	48,308

2204	Market studies and promotion of local crop diversity products for income generation	103,000	54,897	48,103
2206	Strengthening community institutions	136,467	44,449	92,018
3205	Training modules - community gene banks and seed systems	20,000	3,321	16,679
3206	Training for national and regional public officers	46,400	10,634	35,766
3302	Steering Committee meetings	28,000	4,253	23,747
3303	Project technical group meetings	31,500	3,949	27,551
3304	Institutional working group meetings	24,000	4,061	19,939
3306	National and regional policy dialogue on ABS	65,030	4,687	60,343
3307	Project workshop and seminars	65,000	14,597	50,403
4102	Office supplies	30,000	3,789	26,211
4105	Office equipment (computers, printers, tablets, GPS, cameras, projectors)	15,000	381	14,619

8.3.2 Co-Finance

48. In absence of year-wise expenditure (which is not maintained and was, therefore, not made available to the reviewer), the perusal of cumulative expenditure up to June 30, 2020 under the Co-finance (the details of head-wise expenditure is presented in **ANNEXURE- II**), the reviewer noted 61.6% of planned Co-finance had been made available to the project and recorded as such, which is compiled from July 01 (Y1) to June 30 of every subsequent year. The cumulative expenditure under cash and in kind Co-finance appear to be satisfactorily spent as revealed during interaction with the project partners who expressed full satisfaction. In addition, the latest figure of expenditure up to June 2021 shows availability of **~2.5 million US$ under Co-finance**. The reviewer had access to all the audited reports, however, they were recompiled to make yearly expenditure under GEF Trust Fund as well as under Co-finance.

49. The overall expenditure under the GEF Trust fund as well as under Co-finance is rated as MS owing to slow rate of expenditure during the first year of the project and in 4th year due to Goi's restrictions on travel and assembly of people for meetings etc. It is, therefore, concluded that the overall financial management was Moderately Satisfactory because of slow expenditure in 1st year of the project followed by Covid-19 pandemic, which brought severe restriction on travel and meetings resulting in slow rate of expenditure during the year 2020.

8.4. Efficiency

50. The project has so far been executed efficiently mainly due to complete co-ordination between the PC, PMU and the partners in the four agro-eco regions; consequently, despite pandemic and several other minor constraints all the planned activities could

be undertaken except travel and meeting scheduled during 2020 and 1st half of 2021. Thus, the reviewer was pleasantly surprised on many occasions where mid-term target had been exceeded. The work was, however, adversely affected in Leh and Kargil due to inaccessibility during winter months and Covid-19's restrictions during summer of 2020. The project planning was sound and implementation started although, a bit late but Covid-19 pandemic was unforeseen event that adversely affected the efficiency resulting in slow progress in component-2.

8.5. Monitoring and Reporting

51. The progress under the project at mid-term has been highly satisfactory in component 1 & 3 and moderately satisfactory in Component-2 despite Covid pandemic in 2020. In fact, some of the mid-term targets have exceeded in the component-1 as well as in component-3, which reflects efficient and effective execution. NE and CT regions have excelled in their performance and have come out with value chain and marketing of 05 varieties of rice at regional and national level. Hot Arid and NWH regions have also been moving ahead with value chains, many of which are likely to be launched during the current year - 2021. Steering Committee meeting was, however, infrequent. GEF and UNEP reporting commitments were fulfilled as evidenced from the fact the annual review, interaction and guidance were readily available (as and when required) from the TM in Bangkok even when he was travelling.

8.6. Sustainability

52. The sustainability of the project after its completion and withdrawal thereafter appears to be bright because of the presence of partners with permanent set up in the area charged with agricultural research and extension. In addition, the objectives of these institutions are aligned with the objective of this project. The five agricultural Universities and four institutes of ICAR have been functioning (in the region) for several decades and they will continue to work in the area. As regards, NGOs, all of them are credible and they have taken interest in setting up farmers' producer organization (FPOs) - a farmers' body; thus their long term interest is glued to the farmers. Furthermore, sustainability of the project is assured when they are linked with eight KVKs, which are situated in the same districts where the project sites are located. Above all the farmers at all the sites are excited with the program and outputs of the project. They are eagerly waiting to cultivate the elite land races which gets into the value chain where higher net profit is expected while avoiding high chemical inputs in terms of mineral fertilizers and chemical pesticides. In addition, in the so called 'Green Revolution Areas' like Punjab, Haryana, western Uttar Pradesh where farmers apply heavy dosage of Chemical fertilizers, the normal ratio of 4:2:1 of NPK is not maintained and much higher proportion on nitrogenous fertilizers are applied which invariable causes toxicity and pollute ground as well as river water. Since cultivation o0f elite land races do not require heavy dosage of mineral fertilizers, the farmers as well as consumers both are satisfied with low input on one hand and low chemical residue in the produce on the other. Thus, long term sustainability is foregone conclusion.

8.7 Factors affecting Project Performance, Cross-cutting and Core Issues

8.7.1 Preparedness, Launch and Orientation of Partners

53. Bioversity Intl. has been engaged with conservation and utilization of biodiversity for a long time and it is their interest in this area that drove them to submit a project for financial assistance from UNEP for which they have been working for a couple of years before submission of the project. In addition, after release of the fund, the project was launched on July 18, 2017 along with inception workshop during July 18-21, 2017 with all the partners with a view to orient them on implementation arrangements, reporting systems, management procedures, plan of action, monitoring and evaluation requirements, risk tracking system and technical as well financial reporting requirements. This reflects their advance preparation and readiness to launch and complete this project.

8.7.2 Quality of Project Implementation and Execution

54. The efficiency as well as effectiveness of project management with regard to: providing leadership towards achieving the planned outcomes; managing team structures; maintaining productive partner relationships have been very good thereby exceeding the target fixed for mid-term in some of the outputs in component-1 as well as in Component-3. Adaptive management has been practised by the PD as well as PC as evidenced by the fact that despite National Lockdown, the concerned staff at 18 out of 20 (exception being Leh and Kargil) sites worked dedicatedly and therefore, all the trials were sown and harvested.

8.7.3 Stakeholder Participation and Cooperation

55. Stakeholders' participation and cooperation have been found to be exemplary in this project mainly due to willing cooperation of not only the project partners but of the state governments (Govts) and GoI's officials. The quality of participation is very high and therefore, the outputs of the projects were disseminated fast showing an impact within a period of three years of project implementation.

8.7.4 Responsiveness to Human Rights and Gender Equity

56. The project has been fully responsive to the human rights and nowhere could I see any violation of human rights during site visit as well as during interaction through video-conferencing. In addition, this project is trying to involve proportionately higher number of women and tribal farmers, which is likely to help the disadvantaged section/group of the society.

8.7.5 Environmental and Social Safeguard

57. The process of environmental and social screening, risk assessment and management (avoidance or mitigation) of potential environmental and social risks and impacts associated with project and programme activities has been made by the project and

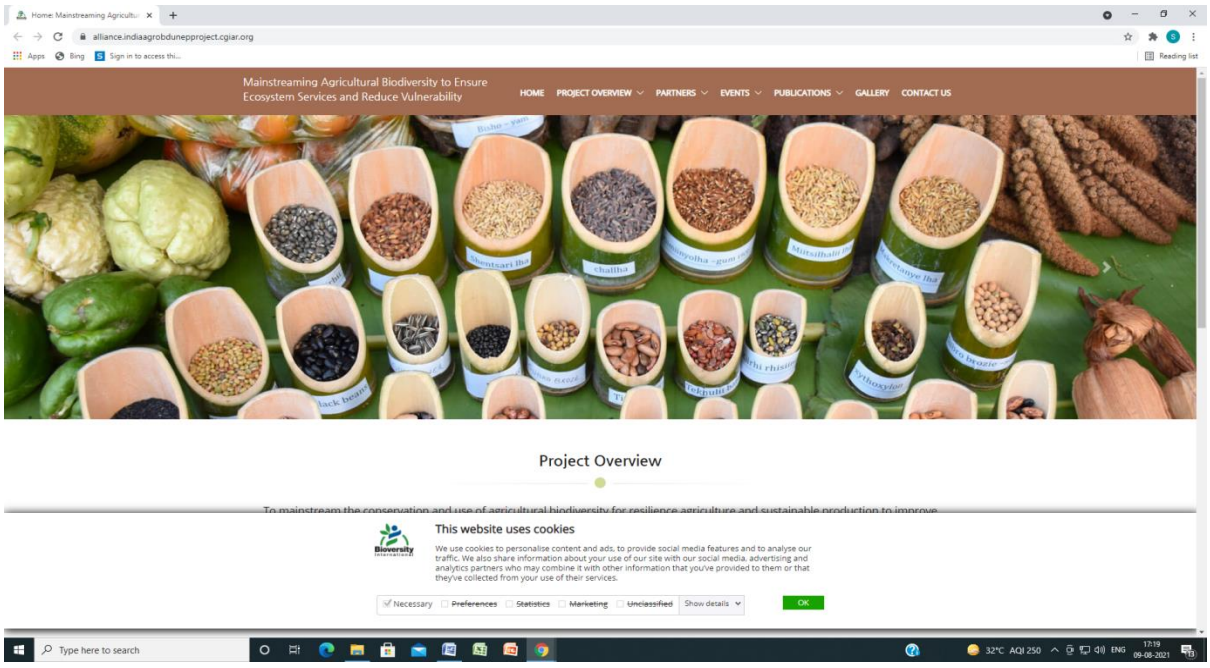
this project has no such risks. The project has of course been involving women farmers in a big way to increase their participation and thereby ensuring social safeguard.

8.7.6 Country Ownership and Driven-ness

58. The project is fully owned by the farmers and GoI as evident from the massive co-financial support and involvement of its institutions at Federal as well as six state governments of Rajasthan (Raj), Chhattisgarh (CD), Madhya Pradesh (MP) Uttaranchal (UA), Uttar Pradesh (UP) and Himachal Pradesh (HP). The ownership is of course yet to be comprehended in newly farmed Union Territory of Ladakh situated at very high altitude area which remains frozen during winters as the work could not start here in full swing due to Covid-19's pandemic. The project attracts keen interest from the federal as well as state governments and is driven by them.

8.7.7. Communication and Public Awareness

59. Knowledge management and communication in the project is mainly through regular meetings across the board. Cross learning was shared during these meetings so that the learning from one site/ agro-eco region is shared effectively. Availability of IT facilities have also helped in this direction. A Website has been developed by the project (https://alliance.indiaagrobdunepproject.cgiar.org/ which facilitates quick dissemination of knowledge



WEBSITE OF THE PROJECT - https://alliance.indiaagrobdunepproject.cgiar.org/

60. As regards communication of the accomplishments and knowledge dissemination among the public and farmers, a lot of efforts were made by the NGO partners by publishing article and news in the print media i.e. Newspapers. Few examples of such efforts are captured below:

Newspaper Cuttings from the Western Hot Arid & NW Hill Agro-eco Regions

8.7.8 Strengthening of farmers with respect to enhancement in their income and climate resilience

61. As a result of intervention of the project in terms of identification, selection, multiplication, branding and marketing of the unique farmers' varieties, five land races of rice – four in NE Region and one in CT Region, production as well as demand for these varieties are increasing. Therefore, the cultivators (farmers) have started getting higher net return (~25%). However, it's not possible at this stage to quantify them. In addition, most of the potential land races selected by the farmers are tolerant to biotic and abiotic stresses especially drought thus imparting climate resilience. More systemic work is, however, needed to identify and characterize the climate resilient lines.

8.7.9 Support for Improved farming and Marketing

62. Many of the farmers' varieties are known to be cultivated in mixed farming. The project has, however, been able to screen the potential varieties as sole crop and the package of practices for their cultivation require les externally supplied inputs like mineral fertilizers and chemical pesticides; consequently there is a great demand for the produce. Branding and linking the NGOs with regional markets have already started paying rich dividends which is likely to increase further once the linkage for marketing at national level gets strengthened.

8.7.10 Benefits through enhanced access to Existing, New and Lost biodiversity provided by the project

63. The farmers of the project area have shown immense interest in getting back their old varieties (land races) which they had been cultivating for long but these were either slowly lost/reduced or replaced with modern high input responsive modern varieties. As for example the farmers of Hot Arid region were excited to get back ***'Peeli Bazri', 'Moonchhwali Bazri,**'* ***Surkhani Bazri,*** with longer storage life of the flour and low level of bird damage. ***Jhumka Moth*** of moth bean was another popular variety liked by the farmers. This is evidenced by the fact that the land races of earl millet recently won 1st and 2nd prize in the farmers fair at ICAR-CAZR, Jodhpur. Likewise, the farmers of CT region are excited to see the age-old varieties of rice (***Jeera Phool, Dhania Dhan, Bauna Dubraj and Sancharia***), naked barley and millets. Farmers in other agro-eco regions like NWH and NE Region also showed great interest in the biodiversity of the selected crops in their area like finger millet, kidney bean, rice bean, amaranth and black soybean.

64. Apart from the above, NBPGR with twenty of their scientists associated with this project, supplied 1,676 accessions of seventeen crops to the partners who, in turn, reported selection of several of them as potential varieties although they were exotic collection. Thus, farmers got the benefit of not only selecting potential varieties from the existing and lost land races but from the exotic collections too.

8.7.11 Exit Strategy

65. The exit strategy should ensure smooth handover of the project to the farmers along with the partners (four ICAR Institutes, five SAUs, 8 KVKs and 7 NGOs) who have a permanent bases in the respective agro-eco region and thus, they have long term interest in the farmers in their catchment areas and because of this very reason they joined hands with Bioversity Intl. to implement this project. Thus, the sustainability of the project can be taken for granted. In addition, the replicability of the results in terms of selected farmers' varieties further strengthen the degree of sustainability.

66. The reviewer suggests establishment of a **'Sustainability Fund'** at all the twenty project sites in the name of SHGs by depositing 5% of the cost of inputs given to the

farmers from the project. Since the sustainability fund would be deposited in a Bank or Post Office savings Bank in the name of SHGs. The amount, thus, collected would be spent at the same site after withdrawal of the project by the respective SHGs for sustainability after withdrawal (for detailed & overall rating Pls. see **ANNEXURE-III**)

SECTION-III REVIEW APPROACH AND METHODS

9. Objective of the Review

67. The objective of the MTR is to assess the accomplishments and challenges at midpoint of the project and recommend corrective measures to achieve the stated outputs and outcomes. In order to find out whether the project objectives were thoroughly worked out and whether project outcome's indicators were SMART (Short, Measurable, Attainable, Relevant and Time-bound), the review indicates that the project was well-conceived and was need of the day specially after India becoming the exporter of rice and wheat and enactment of Food Security law by the Indian Parliament, how the fast dwindling local land races of the 20 crops (selected in the project) can be saved far the posterity.

10. Key Review Principles

68. The reviewer tried his best to reach to project sites for personal field visit, personal interaction through videoconferencing, interaction with the officials of the Federal and State Government, farmers, seed producers and seller to ascertain the progress in the project at ground level. In addition, the reviewer addressed the following questions:

- The production of planned outputs and milestones, in terms of quantity, quality, usefulness and timeliness
- Project impact performance in achieving project objective and outcomes' indicators (in the results framework); including the GEF Core Indicators;
- Project progress on, and quality of outputs;
- Project performance against standard UNEP MTR quantified criteria
- Project progress against available and spent budget (GEF & co-finance);
- Sustainability and replicability of project achievement towards outputs and outcomes to date;
- Compliance with environment, social and economic safeguards, as well as gender equity;
- Consider sustainability issues and exit strategy;

69. While reviewing the progress of the project at mid-point, it was ensured that the gender equity is kept in mind and to ensure whether the benefits of the project reached to the women and tribal farmers who have remained economically behind the fellow farmers in other states but have been champions in conserving the biodiversity of crops in the area they reside. Apart from this, the reviewer tried to find answers to the above questions which were verified from different sources before reporting in the MTR.

11. Key Strategic Questions

70. The reviewer addressed the following strategic questions:
    i. Monitoring and Reporting/Monitoring of Project Implementation:
    ii. Factors Affecting Performance/Stakeholder Participation and Cooperation
    iii. Factors Affecting Performance/Responsiveness to Human Rights and Gender Equality:
    iv. Factors Affecting Performance/Environmental and Social Safeguards
    v. Factors Affecting Performance/Communication and Public Awareness
    vi. Strengthening of farmers with respect to enhancement in their income and climate resilience
    vii. Improved farming and marketing support and
    viii. Benefits through enhanced access to Existing, New and Lost biodiversity provided by the project
    ix. Exit Strategy

71. And their replies have been provided in 8.5 for question no. (i) and for the rest (ii-ix) in 8.7 **(Pls see for details).**

12. Desk Review

12.1 Project-related documents:

72. The reviewer went through the following documents which were made available by the PC (For details Pls. see **ANNEXURE-IV**)
    a. Project Proposal
    b. Result Framework
    c. Annual Project Reports (PIR for 2017-18; 2018-19, 2019-20, & 2020-21)
    d. Technical Reports submitted by the partner institutions
    e. Technical Reports submitted by the NGO partners
    f. APPENDICES of the project proposal
    g. ANNEXURES of the project proposal

73. Out of the above reports special emphasis was given on the PIR submitted for the year 2017-18, 2018-19, 2019-20 and 2020-21 along with the Result Framework given in the project proposal so that there remains no incongruity between the mid-term target given and annual PIR.

12.2 Face-to-face consultations:

74. Face to face consultations were done using “semi-structured interviews” with a following key set of questions:

    i. How relevant is the project?
    ii. What have been the project’s achievements (at the output, outcome & results levels)?
    iii. How were these results achieved? What issues have arisen that hinder the achievement of the results?
    iv. What planning instruments were designed, adopted and / or implemented to deal with mainstreaming of agricultural biodiversity?
    v. What impacts have occurred due to the project (policy, investments, etc.)?

75. Triangulation of results, i.e. comparing information from different sources, such as documentation and interviews, or interviews on the same subject with different stakeholders, was used to corroborate or check the reliability of evidence could be done for the data from the Western Hot Arid and part of NWH region only.

13 Interview (individual or in group)

13.1 Interaction with the National Focal Points on PGR, Project Partners and UNEP's Asia Pacific office

- **Department of Agricultural Research and Education (DARE) of the Ministry of Agriculture& Farmers' Welfare:**
  Dr T. Mohapatra, Secretary, DARE and Director General, ICAR-Individual Meeting
- **Lead Govt. Agencies *viz.* Ministry of Environment, Forest & Climate Change; Govt. of India, New Delhi**
  Mr Atul Bagai, Country Representative of UNEP in India- Video-conferencing
- **UNEP Task Manager (TM), Asia-Pacific Office, Bangkok**
  Dr Max Zieren - Video-conferencing
- **UNEP Fund Management Officer- In absence of the concerned officer**, input taken from the TM Dr Max Zieren- Video-conferencing
- **Project Manager**
  Dr Jai C Rana, Country Representative, Bioversity Intl. New Delhi- Individual Meeting
- **Protection of Plant Variety and Farmers' Authority (PPVFRA), New Delhi**
  Dr KV Prabhu, Chairperson, PPVFRA, New Delhi-Individual Meeting
- **ICAR- National Bureau of Plant Genetic Resources (NBPGR) New Delhi**
  Dr Kuldeep Singh, Director, NBPGR, New Delhi-Individual Meeting
- **ICAR-Central Arid Zone Research Institute (CAZRI), Rajasthan**
  Dr OP Yadav, Director, CAZRI, Jodhpur- Individual Meeting
- **ICAR-All India Coordinated Research Project on Pearl Millets, Rajasthan**
  Dr Tara Satyavati, Project Coordinator (Pearl Millets, AU, Jodhpur-Individual Meeting
- **ICAR-*Vivekananda Parvatiya Anusandhan Sansthan* (VPKAS), Uttarakhand**
  Dr Lakshmi Kant, Director, VPKAS, Almora-Individual Meeting
- **Indira Gandhi Krishi Vishwavidyalaya (IGKV), Chhattisgarh**
  Dr SK Patil, Vice Chancellor, IGKV, Raipur- Videoconferencing
- ***Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya* (RVSKVV), Gwalior, MP**
  Dr SR, Rao, Vice Chancellor, RVSKVV, Gwalior, MP-Telephonic
- **Assam Agriculture University (AAU), Assam**
  Dr. Bidyut Chandan Deka, Vice Chancellor, AAU, Jorhat-Telephonic
- ***Chaudhary Sarwan Kumar Himachal Pradesh Krishi Vishwavidyalaya* (CSKHPKV), Himachal Pradesh-**Telephonic
  Dr. Harinder Kumar Chaudhary, Vice Chancellor, CSHPKV, Palampur-Telephonic

- **Agriculture University of Jodhpur (AUJ), Rajasthan**
  Dr B. R. Chaudhary, Vice Chancellor, AU, Jodhpur-Individual Meeting
- **Action for Social Advancement (ASA), Madhya Pradesh-**Video-conferencing
- **Deendayal Research Institute (DRI), Madhya Pradesh-** Video-conferencing
- **Foundation for Development Integration (FDI), Assam-** Video-conferencing
- **Gramin Vikas Vigyan Samiti (GRAVIS), Rajasthan-**Individual Meeting
- **Lok Chetna Manch (LCM), Uttarakhand-** Individual Meeting
- **Himalayan Research Group (HRG), Himachal Pradesh-** Video-conferencing
- **Mount Valley Development Association (MVDA), Uttarakhand- Individual Meeting**
- **Members of the Project Steering Committee-**Individual Meeting
- **Project Team (HQ and field)-** Individual Meeting/ Video-conferencing
- **Project Management Unit (PMU)-** Individual Meeting/ Video-conferencing
- **Farmers and Farmers' organizations-** Individual Meeting/ Video-conferencing
- **Consultants of the project-** Video-conference
  Dr. Prem Mathur- Former Country Representative of Bioversity Intl. in India
  Dr Kailash Bansal- Former Director, NBPGR, New Delhi
  Dr. GA Parray-Former Director of Research at SKUAST, Srinagar (UT J&K)
- **Local Business Partners and Crop Commodity Traders**
  Mr Sudhir Agrawal, Seed Producer, Mathura-Telephonic
- **NGOs Partners in all the 04 agro-eco regions** - Individual as well as Video-conferencing

13.2 Face-to-face meeting with project partners & farmers on the project site(s)

76. During the field visit of three sites *viz.* Jodhpur, Jaisalmer in Hot Arid Region and Almora in in NW Hill region, face-to -face interaction was done with the partners : of the project - the scientists working under the project, the executive authorities (Directors of ICAR Institutes and Vice Chancellors of the SAUs, heads of the NGOs and most importantly the farmers, their opinion noted and reflected at appropriate places in the MTR.

14 Field visits

14.1 Direct observations of project activities and results at the representative field sites:

77. In order to evaluate the progress of the work done under the project, five representative sites (one from each of the agro-eco regions) was scheduled for a visit to find out the ground reality on the progress in achieving the results:

    - **Jodhpur & Jaisalmer in Hot Arid Region- Feb. 19-22, 2021**
    - **Almora in North-Western Hills – March 16-17, 2021**

78. The farmers (men and women both evinced keen interest in restoration of the traditional land races of pearl millet, moth bean, *sesamum*, mustard and chick-pea at both in Jodhpur as well as Jaisalmer. They also were interested in cultivating the elite land races for their own use as well as for the market. Likewise,

farmers in UA (N-W Hills) showed keen interest in their local land races which, had several unique characteristics that are absent in new HYVs. Therefore, they were also keen on reviving cultivation of the old land races and their restoration in their food system. The results presented from the above two agro-eco region *viz*. Hot Arid and N-W hills are based on confirmation and verification from various sources. In contrast, the results presented from the Central Tribal and North- Eastern region are based on single source i.e. the project staff.

Meeting of Hot Arid Zone at CAZRI Jodhpur on February 19, 2021

Mother Trial of Mung Bean, Moth Bean & Pearl millet in Hot Arid Region

Interaction with Men and Women Farmers in Hot Arid Region on Feb. 20, 2021

Reviewer with Farmers in Jaisalmer
Feb. 20, 2021

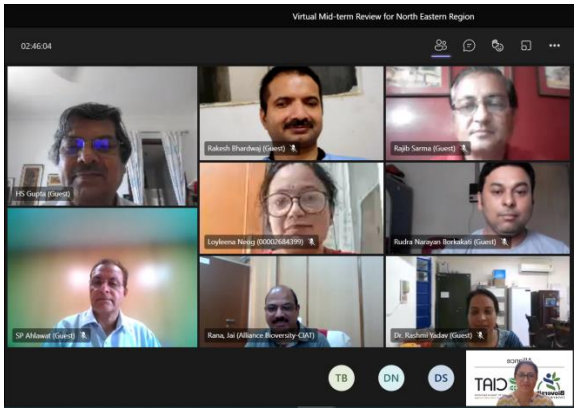
Interaction with farmers at Almora
March 17, 2021

Detailed itinerary for visiting Western Hot Arid and part of NWH regions has been provided in **ANNEXURE – VI.**

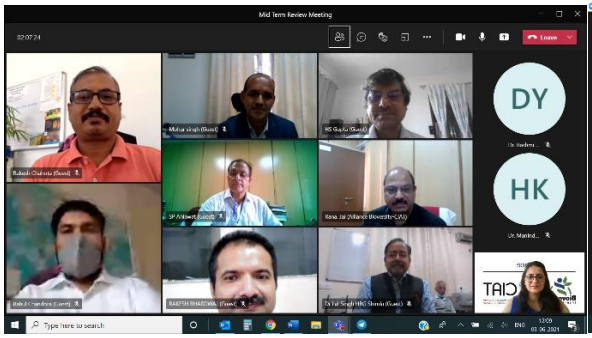
14.2 Indirect Observations of Project activities and Results through Tele-/Video-conferencing

79. Although field to visit was planned for all the four agro-eco regions at five project sites but after the visit of the three sites, two in Hot Arid region and one in the NW Himalayan state of Uttaranchal, Nation-wide lockdown was clamped by the GoI and reviewer himself got infected with Corona virus. We although waited for the pandemic to subside so that the planned travel and physical interaction could be made but this had to be abandoned due the time-limit for submission of the MTR. In the event, several ZOOM MEETINGS were organized to facilitate interaction with the partners in CD, MP, HP, Union Territory (UT) of Ladakh and NE Region. An attempt was made to have thorough interaction by giving full day to CD & MP, HP and UT of Ladakh and NE Region in view of their importance.

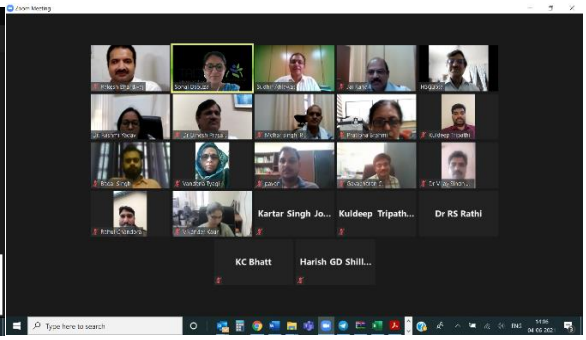
Zoom Meeting of Central Tribal Region
May 15, 2021



Zoom Meeting of NE Region
May 28, 2021



Zoom Meeting of NWH States
(June 03, 2021)



Zoom Meeting with PC and Scientists of NBPGR (*June 04, 2021)*

15 Data collection and Analysis

80. Annual reports submitted by the partners and consolidated annual reports submitted by the Project Director along with Project Proposal and Result Framework were used for data collection. Apart from this, field visits enabled the reviewer to see for himself the progress made in the project. Of course, this could be done only for the Hot Arid and part of North-Western Himalayan Region. The data collection from the rest two agro-eco regions *viz.* Central Tribal and North–Eastern Region was through video- and tele-conferencing. The data collection was, therefore, only partly successful and were captured from all the sources in Hot Arid and NWH; however, it was done through video-conferencing from Central Tribal and NE Region. Analysis of the data was, thereafter, done in Delhi at the office of the Bioversity Intl. If required, telephonic contacts were made to gather missing information as and when required.

SECTION-IV: CONCLUSION AND RECOMMENDATIONS

16 Summary Progress and Key Findings

16.1 Summary Progress

81. In order to enhance genetic diversity on farm, 2,762 native varieties of 20 crops were tested in 549 participatory variety selection (mother) and 4,304 baby trials. Farmers identified 161 varieties of different crops as the most potential varieties suited to their diverse needs. Seed system of these varieties were strengthened with 29 community seed banks at 17 project sites. For adopting best practices at community level, 442 farmers were trained and designated as 'Champion Farmers' along with 139 Self Help Groups (with membership of 1,138 women and 562 men farmers) are closely working with 25 Farmers' Producer Groups and 20 private companies on value addition which oversaw the product development for improved adaptation, enhanced income and livelihoods. In total, 11,593 farmers comprising of 6,870 men and 4,273 women are using crop diversity of 161 varieties for improved adaptation and livelihoods.
82. Presently, the area under potential varieties is around 22,000 ha, which is expected to expand to 65,000 ha by 2022 by involving ~27,000 farmers. To improve the livelihoods, value chain including marketing was developed for 4 native varieties *viz*. *Kola Joha, Boga Betguti, Amona Bao and Ronga Bao* out of 24 heritage rice varieties. After nutritional profiling, these varieties they are being marketed under the brand 'Native Basket' in Assam. Armed with a brand name, their everyday sale has significantly increased. The aromatic rice variety (*Kola Joha*) attracted 25% higher price. Over 2,000 farmer families will be benefiting the whole gamut of activity from production to processing and sale. Another value chain has been developed to *Jeera phool* aromatic rice of Chhattisgarh wherein the commercial production of *Jeera Phool* has started giving significantly higher net return due to low input cost in cultivation and higher sale price because of organized cultivation, processing and branding. This has become possible because of the sincere efforts made by the staff dedicatedly working despite pandemic of Covid-19.

83. The quality of output and its timeliness for their utilization has been highly satisfactory which has attracted attention of the state governments of Rajasthan, Chhattisgarh (CD), Madhya Pradesh (MP), Uttarakhand (UA) and Himachal Pradesh (HP). The chances of replication and up-scaling of the results in the project are very high as the selection of 161 varieties are based on mother and baby trials. More importantly, farmers were active participants in the selection. Almost everyone who hears about this project's work on traditional varieties gets excited and people are looking eagerly for the exciting output that would lead to fruitful outcome which will benefit farmers especially women farmers with improved livelihood and income. The quality of nutritional analysis does not, however, appear to be of very high standard; thus, requires confirmation by a 3rd party to which the PD has already agreed. Therefore, nutritional analysis of all the 161 land races should be complete as early as possible because some more varieties will be added to the list of potential varieties from the last years' baby trials.

16.2 Key Findings

84. The project has indeed succeeded in identifying 161 elite land races of 20 crops and value chain analysis completed for 9 crops many of which are nutritionally rich in protein, essential amino acids and micronutrients like Fe & Zn and five value chain products launched in rice. This is a commendable work done in two years of time (2018 - 2019). These land races armed with unique attributes have existed with the farmers for a very long time but in absence of the planned and systematic efforts, they could not see the light of the day. The current project has, therefore, acted as a catalyst in mobilizing farmers to acquaint themselves with the advantage of crop diversity, their conservation and utilization, which will result in mainstreaming of the biodiversity especially of the 20 crops selected in this project. Rest of the 19 crops too have more or less the same potential, therefore, a concerted effort is needed to replicate the success of rice in other crops. The project identified one hundred and sixty one (161) potential land races from 2,762 native varieties through 549 Mother and 4,304 Baby trials, establishing twenty nine CSBs, with an area twenty two thousand (22,000) ha covered by these traditional land races and twelve value chain products from seven crops. Apart from this, the project has established a strong network of institutions (four ICAR Institutes, five SAUs, seven NGOs and eight KVKs) which, with active and coordinated partnership, have been able to exceed even the mid-term targets in component -1 and component -3 despite several constraints.

85. The project has, however, not been so successful with component-2 dealing with mechanisms for improved coordination and implementation to promote better mainstreaming of conservation, use and sharing of crop diversity developed and supported by relevant policy instruments, regulations, strategies and plans including access and benefit sharing owing to late start of the project on one hand and the restrictions on holding meetings and travel by the GoI due the pandemic of Covid-19 for almost 14 months (March 2020 t0 May 2021) on the other. Yet, due to major focus (of the project) on field programs, the science and assessments; which allowed less focused attention to policy engagement, governance and related fields, the project exceeded the targets in two components (1&3), resulting in slow pace of progress in the component -2. **The excellent progress in component 1 & 3 reflects value for money spent in the project.**

86. The technical quality, outputs, timeliness and targeted outcomes with respect to Component 1 and component-3 were highly satisfactory except for the nutritional analysis, which needs to be confirmed by a 3rd party as in some crops the level of micronutrients like Zn and Fe are shown to be very high and not reported so high so far. Therefore, a confirmation is required by a 3rd party like National Institute of Nutrition, Hyderabad to avoid any complication at later stage. As regards sustainability and replicability, except the nutritional analysis in some crops, all other outputs are replicable as well as sustainable.

87. In reviewer's opinion, the result framework is very well and systematically planned with time lines but all of them could not be executed because of late start and covid pandemic. It is now suggested that the meetings and travel should be undertaken fast so that the leftover targets of Component-2 should be attended on priority coupled with active involvement of the consultants in the project. Apart from this, stakeholders' engagement and partnership have been exemplary except for the Leh and Kargil which again should be attended on priority during 2021 & 2022 with help of another consultant based in Srinagar (J&K). Covid-19 has adversely affected the output as well as deliverable and therefore frequent on line meetings with the partners will be of great help. The procurements for community seed banks should be expedited and those ones which need to be strengthened should be asked to procure the storage bins fast as 3rd wave of Covid-19 is likely to hit India.

88. The outputs from all the four agro-eco regions have been pretty good but the deliverable were definitely more from the Hot Arid and Central Tribal Region have been exemplary. NE region concentrated only on rice, but other crops were not given due attention especially green gram and black gram and mustard which are major source of protein and lipids respectively. NWH Region comprised of Central Himalayan states of UA, HP and UT of Ladakh where huge variability in nutria-cereals like Finger millet, buckwheat, amaranth and kidney bean, rice bean and black soybean among legumes in UA & HP. Therefore, special emphasis should be given on these crops in NWH region. The outputs from Hot Arid and CTR have been better due to the dedication and hard work whereas outputs from NWH and Eastern Region can be improved by frequent monitoring and evaluation.

89. The pseudo-cereals like finger millet, pearl millet, *Paspalum scrobiculatum (kodo)*, *Panicum sumatrense (kutki),* buckwheat and amaranth are known to be rich in minerals and essential amino acids along with complex starch that breaks down slowly in human stomach, therefore, they are good for diabetics. India has of late emerged as capital of diabetics, therefore, **these pseudo-cereals have a special significance and hence, the project should take advantage of it while marketing the value chain products for urban areas. In addition, nearly 70% of India's population suffers from protein deficiency**, therefore, legumes like kidney bean, rice bean, black gram, green gram and soybean (especially black soybean of UA) will be the excellent sources of protein, therefore, priority should be given in developing value added products as well as marketing these unique legumes as such by branding them as **PRODUCT FROM HILLS**. In fact, some of the value added products like *Laddu* of amaranth and Sesame, Biscuits of finger millet and amaranth, *Sattu* from roasted naked barley and *Dubk*a from black soybean will go a long way in reducing malnutrition through these land races.

90. There was, however, delay of eight months in starting the project compounded further by the corona-19's pandemic (in 3rd year), which slowed down the project work during 1st and 3rd year; yet, the project has been able to meet the outcomes in Component-1 and Component-3. The output is indeed value for money spent as there are around 45% of the GEF Trust fund and 35% of the Co-finance remained unutilized as on Dec. 31, 2020 and June 2020 respectively. In my opinion, the project staff tried to execute the project meticulously and thus were capable of achieving all the targets; yet, the same could not be achieved in component-2 mainly due to Covid-19's pandemic and restrictions on travel and physical presence in the meetings. Therefore, the project staff should be given an opportunity to make up the loss by giving extension for the period they have lost on account of delayed start (eight months) and Covid-19's pandemic (ten months). Hence, there is a strong case for giving extension to the project beyond Jan 16, 2022; the details for which is given below:

16.2.1 Need for a No Cost Extension (NCE)

91. Since the project has lost almost one and a half year (18 months) on account of late start and Covid-19's pandemic, it is running behind schedule in attaining the targets mainly of component-2. Therefore, it is justified to compensate the period lost due to circumstances beyond control of the project. This extension will provide an opportunity to make up the loss and thus would contribute effectively in fulfilling the objective and outcomes originally proposed in all the three components with special emphasis on the following outputs in **Component-2, which will, very likely, be completed during the extended period**:

Output 2.1 National and regional policy platforms, including involvement of ministries, local communities, indigenous organizations, farmers, private sector, to promote leadership and mainstreaming of agricultural biodiversity conservation and use including ABS.

Output 2.2 Analyses of public policies, relevant instruments and regulations undertaken and gaps identified and incentives for improved sustainable use and conservation of agricultural biodiversity including provisions and opportunities for improved access and benefit sharing

Output 2.3 Model agreements that regulate access and benefit sharing with farmers communities and which recognize the core principles of Access and Benefit Sharing (ABS)

Output 2.4 National and regional strategies and plans on integrated sustainable agricultural improvement, use and benefit sharing of agricultural biodiversity developed and supported by implementation programs of work

92. Since the work on the above outputs were initiated during the end of 2nd year (2019); meanwhile the country was struck with Corona pandemic in 3rd year (March 2020), the consultations in terms of meeting and conferences could not be held. In addition, 'End of the Project Targets' of the Component-1 and Component-3 in which excellent progress has been made, will also be completed.

93. Having given the benefits likely to be accrued to the project due to a NO COST EXTENSION, the reviewer would like to describe the possible consequences, in case,

the project is asked to wind up on scheduled date of Jan 16, 2022 (i.e. sixty month after receipt of the 1st GEF Trust fund on Jan 17, 2017). These could be as follows:

(i) The project work will remain incomplete and thus the outcomes of component-2, which concerns mainly with policy and governance of ABS, will remain only partially accomplished. This will deprive the farmers with gains already made in component -1 & component-3 also.

(ii) The project will not be able to make intended positive impact and encourage the GoI's policy of conservation & utilization of crop biodiversity in terms of traditional land races or farmers' varieties for environmental safety and enhanced income as well as livelihood support to the farmers in the project area.

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(iii) The value chain development and resultant marketing at regional and national level leading ultimately in substantial increase in farmers' income will remain a distant dream.

(iv) Having identified twelve value chain products in seven crops, the packaging and marketing of these value-added products will not be able to deliver intended benefits to the farmer producers as well as consumers in terms of improved nutrition owing to protein and micronutrient-richness of these crops.

(v) Whereas, an excellent work has been done in rice, but the project has been lagging behind in other corps like legumes, oilseed and spices and these can be accomplished only if an extension is given. The project will, therefore, be deprived of the monitory and nutritional benefits to be provided to the farmers as well as consumers both.

94. Therefore, in the reviewer's opinion, a No Cost Extension (NCE) of eighteen (18) months will allow the project **staff to work for four more crop seasons (two in summer and two in winter (except Leh and Kargil),** which will not only help in making up the lost period of eighteen months but will help in fulfilling the objectives of the project **resulting in accomplishing the outcomes originally envisioned in the project Document.**

17. Lessons Learnt

95. Prioritization of work on the crops is extremely important. There seem to be too much emphasis on rice (an important cereal though) but other nutri-cereals like *Paspalum scrobiculatum, Panicum sumatrense*, amaranth, buckwheat, kidney bean, rice bean, horse gram have gained much importance due to climate resilience and better nutrition than common cereals like wheat & rice as well as other legumes. **Adequate emphasis, therefore, should be laid not only in identifying but developing value chain of these crops especially from *Paspalum scrobiculatum (Kodo)*, *Panicum sumatrense (Kutki)* in the Central Tribal Region where biscuits, cookies, cakes and tarts can be prepared from *Kodo and Kutki*,** the nutria-cereals and legumes to aid in reducing micronutrient and protein malnutrition. GoI's priority is to reduce malnutrition especially of micronutrients like iron, zinc, vitamin-A and of protein. Therefore, attempts should be made to identify land

races of different crops rich in these nutrients. Kidney bean, horse gram, amaranth and rice bean are rich source of protein and the unique land races of these crops will fast become popular. In addition white rage developed by VPKAS should also be evaluated for nutritional profiling and value added product development.

96. NW Hills, Western Hot Arid, Central Tribal and North-Eastern regions are known in India to consume much less mineral fertilizers and pesticides per ha against rest of the country, therefore, the project should take advantage of marketing the farmers' varieties by prominently mentioning **'Produce of Hills', 'Produce of North-Eastern Region' and 'Produce from Central Tribal Region'.** This will add more value to the value chain of these crops.

97. Administrative delays in appointment of a regular PC should have been avoided because of which almost one year (2017) was lost (seven months in joining of the present PC (Dr Jai Rana) and four months in release of funds to the partners). In addition, because of Covid-19's pandemic, there was a setback on travel and meetings and this may continue further. Therefore, attempts should be made to have fortnightly online meetings with each partner separately and quarterly with all the partners. Online meeting has become a part of the post-covid working in all the offices, therefore, this project should adopt it for frequent interactions with partners so that, in case covid-19 continues to affect physical movements even further, the loss will be minimal.

98. These days most of the farmers have access/own mobile phones, therefore, it is suggested to develop communication through WhatsApp farmers should be contacted frequently for input delivery, crop condition, seed storage and exchange etc.

99. Time-bound responsibility should be given to the consultants; one of whom (based in Delhi should shoulder the responsibility of expediting registration of the selected land races (161 in number) with PPVFRA. So far only 21 of these have been registered and therefore, there is an urgent need to register the leftover one hundred and forty (140) in number. In addition, there is an urgent need to initiate and carry out intensive **dialogue with stakeholders on ABS to evolve a working model for ABS without losing time.** Yet another consultant, (based in Ladakh) should be entrusted with responsibility of **accelerating the pace of work in Leh and Kargil with respect to selection and multiplication of unique land races** as the project will be left with only one crop season as for as Ladakh is concerned because it remains frozen during winters. Meanwhile establishment of community seed banks of the local crops *viz*. naked barley, buckwheat, mustard and kidney bean should be completed in this very important high altitude area so that the farmers of this area do not remain deprived of the fruits of this project.

18. Recommendations

100. On the basis of interaction with project partners, stakeholders and most importantly farmers during this mid-term review and keeping **in view of what has already been accomplished and what has not been achieved as per** plan in the Project Document; the following recommendations are made along with **who will do what and when to complete for** consideration by the competent authority:

1. Registration of farmers' varieties (land races) with PPVFRA should be expedited as it's the 1st step in ABS. Fifty nine varieties out of 298 submitted to PPVFRA, have been registered so far and out of this, only 27 are out of 161, potential varieties. Therefore, registration of rest (134) potential land races should be preferably completed with PPVFRA. However, in case of difficulty in registration with PPVFRA, the National Project Steering Committee (NPSC) suggested their registration with NBPGR and obtaining IC Numbers for each of them **- Dr Jai Rana, BI and consultant based in Delhi by Dec. 2022**

2. Value chain analysis of all other crops should be completed fast specially of *Kodo* (*Paspalum scrobiculatum) and Kutki (Panicum sumatrense),* Also include white ragi (VL Madua-382) developed by ICAR-VPKAS, Almora for preparation of value added products like cookies, cakes and tarts **- Dr Jai Rana, PC of the Project and NGO partners by Feb. 2022**

3. Out of 161 potential land races, nutritional analysis of 121 has been done. Analysis of the remaining 40 should be expedited so that value chain analysis can be undertaken in other crops too. Special emphasis should be given on analysis of protein, micronutrients like Fe, Zn, β-carotene and complex starch for low glycemic index- **Drs. SP Ahlawat (PS) and Rakesh Bhardwaj of ICAR-NBPGR, New Delhi by Feb, 2022**

4. Nutritional analysis of the most potential land races used for value chain should be confirmed by a 3rd party like National Institute of Nutrition, Hyderabad to avoid confusion/questions/claims at later stage- **Dr Rakesh Bhardwaj of ICAR-NBPGR, New Delhi by December 2022**.

5. With the highest number of potential varieties in CTR, it is expected to possess higher number of unique land races of rice as well as other crops like, *Paspalum scrobiculatum (kodo)*, *Panicum sumatrense (kutki)*. Therefore, a concerted efforts should be made to select them from CTR region for large scale multiplication, marketing of processed grains and training the tribal women farmers in **preparing biscuits, cookis, cakes and tarts from *kodo* and *kutki*** in Hotel management Institute of Bhopal famous for this. Alternatively, the College of Home Science at IGKV should take responsibility to train the tribal women farmers - **Dr Deepak Sharma- Regional Coordinator, CTR, IGKVV, Raipur and all other Regional Coordinators by Nov. 2022.**

6. It is expected that elite land races of most of the 20 crops will soon enter in value chain and will see light of the day by linking them with regional and national market. However, it would be worthwhile to identify few land races of high value crops and by involving plant breeders to remove minor deficiencies like plant height, low Harvest Index etc. which can be corrected and thereafter farmers' right is passed on to the community for the benefits as for example, *Kalanamak* rice (short grain aromatic rice) in eastern Uttar Pradesh. - **Dr Deepak Sharma- Regional Coordinator, CTR, IGKVV, Raipur all other Regional Coordinators by Oct. 2022.**

7. Leh and Kargil are important sites in high altitude area ranging from 12,000 feet to 25,000 feet and are endowed with rich crop biodiversity. The work remains incomplete as trials for only one crop season were conducted; therefore, a concerted effort should be made to select unique land races of naked barley, buckwheat (both the sp. *F. tataricum* and *F. esculentum*), mustard & kidney bean and value chain established during the crop season of 2022- **Leh based**

Consultant, Bioversity Intl., New Delhi and ICAR-CAZRI's Regional Station at Leh by Nov. 2022.

8. Elaborate and intensive efforts are needed to develop a model for ABS so that the farming communities get their due benefits of conserving biodiversity - **Dr KC Bansal-Consultant, Bioversity Intl., New Delhi from Sept. 2021 onwards.**

9. Community Seed Banks should be strengthened by providing lasting storage and drying facilities to enable them to store and exchange quality seeds of land races. Although funds have been released but the procurement of seed bins and dehumidifiers should be expedited **by Dec. 2021-Dr Jai Rana, PC with all the Regional Coordinators.**

10. Post-harvest handling of small grain cereals should be strengthened so that drudgery of the farmers especially of women farmers are reduced through machine threshing like Millet Thresher-cum-Pearler (17 already given) and small rice mill for milling of rice.– **Dr Lakshmi Kant, ICAR-VPKAS, Almora for millets and Dr Jai Rana for rice by Dec. 2021.**

11. NGO partners should be helped in design and development of **attractive packaging** (**comparable to what is available in the market**) by organising interaction with experts in packaging and marketing- **Dr Jai Rana, PC by Feb. 2022.**

12. The success of the project will depend mainly on increasing the demand through strong marketing links at regional as well as national level by linking FPOs with on-line marketing agencies like Amazon, Flipcart & Reliance-Jio etc. -**NGO Partners of all the four Agro-eco Regions by June 2022.**

13. Covid-19's pandemic has adversely affected the speed of implementation, and the Covid-19-appropriate restriction are likely to continue further; therefore, concerted efforts are needed by all the partners to conduct online meetings frequently. In addition, procurement of materials should be completed in time-bound manner by the end of 2021- **Dr Jai Rana, PC and all the Partners by Dec. 2021.**

14. The project, is expected to fulfil all the objectives provided the loss of eighteen months of time due to delayed start and Covid-19 pandemic, is compensated by allowing an eighteen months (18) of no cost extension. This will also enable the project to contribute effectively to the Decade of Ecosystem Restoration - **Project Steering Committee**, **TM and UNEP by November 2021.**

15. Government of India should commit to continue to Co-finance the project in the extended period, in case, it falls short of fund under co-finance during the period of extension by UNEP- **Project Steering Committee by Sept. 14, 2021.**

16. **A 'SUSTAINABILITY FUND'** in the name of SHGs/Farmers Group may be created in which 5% of the cost of inputs provided free to the farmers and 5% of the net profit received by the FPOs are deposited at each site for use by the farmers' groups after completion of the project and withdrawal of the manpower and other facilities - **All the Regional Coordinators and PC of the project by March 31, 2022**