ADB GEF PROJECT IMPLEMENTATION REPORT (PIR)
(This report covers implementation period from July 1, 2021, to December 31, 2021
including recently closed projects covering the reporting period)

ADB Official Project Title: Integrated Natural Resources and Environmental Management Project
ADB Project Number: 41220-013

I. GEF PROJECT SUMMARY

Project Ratings:
Development Objective Rating (DO): Moderately Satisfactory (MS)

Implementation Progress Rating (IP): Satisfactory (S)

Risk Rating: Modest Risk

Information on Progress, challenges and outcomes on project implementation activities
As of 31 December 2021, the project has achieved 96% physical accomplishment and 87% financial achievement (Asian Development Bank, International Fund for Agricultural Development & GEF). The final financial achievement will be determined upon closing of the financial books. Currently reconciliation of financial accounts and expenditures are ongoing and financial closing is expected by 31 October 2022.

During the reporting period, the project focused on the completion of the remaining subprojects (a) establishment, maintenance and protection, and final validation of natural resources management (NRM) subprojects; (b) continuous patrolling of natural forests in the Bukidnon Upper River Basin (BURB) and Upper Chico River Basin (CURB) in the Cordillera Administrative Region (CAR) using the LAWIN System and establishment of small and livelihood enterprises (LES); (c) construction and installation of livelihood enhancement support (LES-1 &2) subproject; and (d) completion of rural infrastructure subprojects.

GEF support has been very instrumental to IP/People Organizations (PO) who successfully adopted the conservation farming models (e.g., intercropping and farm contouring in agroforestry) initiated by the World Agroforestry Centre (ICRAF).

Major accomplishments are:

(i) Component 1: River basin and watershed management and investment

- The re-enhance indicative development plans (IDPs) for the CURB and the Wahig-Inabanga River Basin (WURB) were adopted by the respective watershed management council (WMCs) along their respective watershed management plans (covering 471,526 hectares (ha)).
- While the IDP Lake Lanao River Basin (LLRB) (covering 138,834 ha), through its Lake Lanao Master Plan, remains to be adapted despite series of consultations between local government units and the Ministry of Environment Natural Resources and Energy (MENRE-BARMM). At the end of the project the National Project Coordination office in the Forest Management Bureau of the Department of Environment and Natural Resources (the executing agency, DENR), decided to handover all documents to the provincial local government of Lanao del Sur for their consideration and possible integration with their PDFFP.
- The re-enhance ID Framework for BURB was prepared and a watershed management framework (covering 535,713 ha) submitted to provincial development councils for possible fundings.
- Out of the 20 WMCs created 10 of them have 30% women membership.

(ii) Component 2: Smallholder and institutional investments in conservation increased and URB productivity enhanced in the forestry, agriculture and rural sectors.

Subprojects	Target	Accomplishment as of 31 Dec 2021	% Accomplishment	Uncompleted
NRM[a]	44,059	44,059	100%	-
CBPM (ha)	74,602	74,602	100%	
LES1 (unit)	240	240	100%	
LES2 (package)				
SSF Equipment	52	52	100%	
SSF Construction	28	23	82%	5
RI (no. of SPD)	55	50	91%	5

CBPM = community-based protection management; LES1 = livelihood enhancement support led by DENR = LES2 = livelihood enhancement support led by the Department of Trade and Industry; RI = rural infrastructure; SPD = subproject document; SSF = shared services facilities.

[a] All NRM subprojects reportedly have 80% or above survival rate based on the final validation conducted in the field.

Source: DENR Final CY 2021 Annual Narrative Report.

- All 24 commercial forestry investment subprojects plans (CFISP) across 4 URBs were completely established. This is a set of land use and management strategies that showcase economically viable, socially acceptable, and environmentally sound production systems in the four upper river basins covered by INREMP. **This was develop with ICRAF financed by GEF.**

(iii) Component 3: River basin and watershed management capacity and related governance mechanisms

- The project continued to train and capacitate the partner POs and local government units (LGUs) in the implementation of the subproject. Aside from implementation key knowledge management and development of knowledge management products were conducted for sustainability.

(iv) Component 4: Project management and support services

- All project management offices and consultants were mobilized until project completion and some beyond to assist with the closing of the project financed by the government.

Compared to 2020 (78% physical progress), significant achievement was attained despite the continues challenged from the coronavirus disease (COVID-19) such as travel restrictions, social distancing, just to ensure remaining project outputs are delivered within the project period.

Due to limited time that is also further aggravated by COVID-19, piloting of payment for ecosystem services will not be implemented during this project period, though the mechanism has already been put in place by ICRAF.

Information on Progress, challenges and outcomes on Environment and Social Safeguards (includes Stakeholder Consultation)

Consultations were made across levels: national and subnational government offices, POs/IPOs, and LGUs (regional, provincial, municipal, and village levels) in all four URBs, prior to any initiation of activities. Sufficient budgets were provided by the Project for community consultations, subproject field validation and surveys. Despite COVID-19 restrictions and local lockdowns that hamper project implementation, community consultations, stakeholder's consultative meetings, venues for grievance redress and joint-monitoring activities and subprojects turnover were still carried out. These were made possible with the application of digital technology such as virtual meetings, use of drones, GPS, pictures uploaded for verifications, and use of local people within the area (this reduced travel risk and at the same time provide temporary employment for local communities).

Particular attentions were given to IP organizations evidence by the number of Certificate of Pre-conditions issued by the National Commission on Indigenous People. All 187 applications, to cover subprojects under Output 2 were issued. The issuance of Certificate of Pre-conditions signifies the Free Prior and Informed Consent of IPs.

In preparation to the project closing, the project conducted several capacity-building activities to continuously capacitate the field implementing units and partners to comply with the social and environmental safeguards. A,

technical assistance on the integration of environmental and social safeguards (ESS) for the overall development framework of the INREMP was provided by ICRAF. An Environmental Management Training for LES subprojects on Crop Production and Processing was conducted.

The project is using existing grievance redress mechanisms (GRM) which are established in all levels of the project, to record complaints as result of the project. Visibility boards such as Subproject Information and GRM Posters are installed bearing contact information where grievances, queries and complaints can be lodged aside from the GRM intake forms. Grievance redress reports from POs, LGU SPMUs and field implementing units are summarized and are incorporated in the quarterly progress reports submitted by RPCOs in 4 URBs.

As the project is Category A for IP, an external monitoring agent (EMA) was mobilized in November 2020 to review compliance with the CMPs.

Information on Progress on gender-responsive measures

This project is categorized as Effective Gender Mainstreaming (EGM). As of 31 December 2021, 72.7% (8 out 11) of GAP targets were achieved. Accounting for women beneficiaries on subsidized inputs was still ongoing at the time of reporting. This will be revalidated during ADB's project completion report.

Remaining issues include: (a) difficulty in achieving the 25% female target employment in construction of rural infrastructure; (b) lack of data to show achievement of DMF target 3.3 on women's membership in community watershed protection brigades; and (c) need for more data both qualitative and quantitative data to show empowerment outcomes

Knowledge activities/ Products

No new knowledge products published during the reporting period.
For past knowledge activities and products please click on this link

ICRAF-INREMP website accessible through http://worldagroforestry.org/project/inremp

PROJECT MINOR CHANGE IN SCOPE/MINOR AMMENDMENTS

- ☐ Results framework
- ☐ Components and cost
- ☐ Institutional and implementation arrangements
- ☐ Financial management
- ☐ Implementation schedule
- ☐ Executing Entity
- ☐ Executing Entity Category
- ☐ Minor project objective change
- ☐ Safeguards
- ☐ Risk analysis
- ☐ Increase of GEF project financing up to 5%
- ☐ Co-financing
- ☐ Location of project activity
- ☐ Other

No changes were made during the reporting period.

II. Project Profile

1. General Information	1	GEF ID	3980
	2	Focal Area(s)	MFA
	3	Region	Southeast Asia
	4	Country	Philippines
	5	GEF Project Title	Integrated Natural Resources and Environmental Management Project
	6	Project Size (FSP; MSP)	FSP
	7	Trust Fund (GEFTF; SCCF; LDCF)	GEF TF
2. Milestone Dates	8	GEF CEO Endorsement Date (mm/dd/yy)	29 April 2011
	9	ADB Approval Date if the GEF Fund (mm/dd/yy)	3 December 2012
	10	GEF Grant Signing of the GEF Fund (mm/dd/yy)	22 March 2013
	11	Implementation Start Date of the Project and of the GEF Component (mm/dd/yy)	9 August 2013
	12	Date of 1st GEF Grant Disbursement (mm/dd/yy)	29 September 2014
	13	Final date of GEF Grant Disbursement (mm/dd/yy)	Not yet know. Please see item #16 below.
	14	Proposed/Revised Implementation End (mm/dd/yy)	N/A
	15	Actual Implementation End (mm/dd/yy)	31 December 2021
	16	Expected Financial Closure Date (mm/dd/yy)	31 October 2022
	17	Actual Financial Closure Date (mm/dd/yy)	N/A
3. Funding	18	PPG/PDF Funding (USD)	$291,000 (anticipated)
	19	GEF Grant (USD)	$2,500,000
	20	Total GEF Fund Disbursement as of 31 December 2022(USD)	$ 1,542,371.08
	21	Confirmed Co-Finance at CEO Endorsement (USD)	
	21	Materialized Co-Finance at project mid-term (USD)	
	22	Materialized Co-Finance at project completion (USD)	
4. Evaluations	23	Proposed Mid-term date (mm/dd/yy)	N/A
	24	Actual Mid-Term date - if applicable (mm/dd/yy)	14 March 2017
	25	Proposed Terminal Evaluation date (mm/dd/yy)	31 March 2023
	26	Actual Terminal Evaluation Date (mm/dd/yy)	None yet
	27	Tracking Tools Required (Yes/No/ Focal Area TT)	No
	28	Tracking Tools Date - if applicable (mm/dd/yy) Midterm Tracking Tool Terminal Evaluation Tracking Tool	N/A

III. Project Implementation

A. Project Description:

The Integrated Natural Resources and Environmental Management (INREM) Project (hereinafter referred to as Project) will address unsustainable watershed management in four priority river basins: (i) the Chico River Basin in the Cordillera Administrative Region, Northern Luzon; (ii) the Wahig-Inabanga River Basin on the island of Bohol; (iii) the Lake Lanao Basin in the Bangsamoro Autonomous Region of Muslim Mindanao (previously Autonomous Region of Muslim Mindanao); and (iv) the Upper Bukidnon River Basin in Bukidnon, Norther Mindanao. With focus on indigenous peoples and resource-poor communities, the project will reduce and reverse degradation of watersheds and associated environmental services caused by forest denudation and unsustainable farming practices. It will also provide incentives to local communities, local government units (LGUs), and the Department of Environment and Natural Resources (DENR) for improving natural resources management by generating sufficient and tangible economic benefits. Mechanisms to achieve these project objectives include (i) payments for environmental services (PES) including water regulation, soil conservation, carbon offsets, and biodiversity; (ii) income generation from sustainable use and management and value-added processing of timber and non0timber forest products; (iii) improved natural resources productivity; and (iv) improved climate-resilience in project watersheds. GEF financing will be used specifically to support project activities designed to attain incremental global benefits in biodiversity conservation, and climate change mitigation relating to land use, land use change and forestry (LULUCF).

GEF-supported elements of the project will aim to mainstream planning for climate change adaptation and mitigation into the overall river basin management through a combination of capacity building, institutional development, and demonstration activities. These latter will initially focus mainly in the Cordillera headwaters area and will include the establishment of credible reference emission levels as well as community-based monitoring. Of the four targeted project sites, the Cordillera represents biodiversity resources of high value that are at greatest risk. Concentrating effort in one area will ensure that adequate resources are made available to undertake all required activities. Capacity-building will be initiated at the other three project sites, to prepare local communities and lay the foundation for replicating best practices, once they have been successfully demonstrated in the Cordillera. This phased approach is one way of ensuring that resources are applied in a cost-effective manner

B. Implementation Progress (IP) Rating:

Output	Rating	Evidence/Examples	Issue/Risk/Action
Component 1			
By 2015, river basin indicative development plans and watershed management plans adopted in four project sites covering 1.13 million ha	MS	18 of the 23 watershed management plans have been prepared with breakdown as follows: 8 in CURB, 4 in WIRB, 6 in BURB. IDP of CURB and WIRB were adopted by the LGU IDF prepared for BURB	6 WMPs for LLRB not officially adapted.

Output	Rating	Evidence/Examples	Issue/Risk/Action
By 2018, 81 (23) watershed management and investments plans developed as basis for project investments in 81 LGUs.	MS	57 out of 81 LGUs adopted the watershed management and investments plans. For BURB it's a combined watershed management framework	6 WMPs for LLRB not officially adapted.
By 2018, a GIS based database, including remote sensing information for performance monitoring established and operationalized	S	The geodatabase design was developed and operationalized. 25 out of 27 nodal stations established ((NPCO-1, CURB-8, WIRB-4, BURB-8, and LLRB-4)	
At least 30% of watershed management council members are women.	S	Of the 20 watershed management councils created under the project, 31% members are women.	
Component 2			
By 2020, over 80,152 ha effectively protected through community-based monitoring in four URBs.	S	74,602 ha (CURB: 58,484 ha and BURB: 16,118 ha) effectively protected through community-based monitoring in two URBs	Around 6,554.5 ha were cancelled by the people's organization due to conflict and other prioritization.
By 2020, at least 22,486 ha of natural forestland rehabilitated through reforestation and assisted natural regeneration.	S	22,483 ha rehabilitated through reforestation and assisted natural regeneration.*	
By 2018, over 14,374 ha of agroforestry with community participation and 3,568 ha of commercial plantation established.	S	14,374 ha. of agroforestry with community participation and 3,568 ha of commercial plantation established.*	
By 2018, 3,634 ha of conservation farming demonstration established	S	3,634 ha of conservation farming demonstration established	

Output	Rating	Evidence/Examples	Issue/Risk/Action
By 2020, income-enhancing small-scale infrastructure improvements completed including 133 km of rural access 68 km of foot trails, and 1 provincial trading center; communal irrigation systems for about 269 ha; and 10 units of potable water supply (level II – spring development) schemes	S	Income-enhancing small-scale infrastructure improvements completed – 120.123 kms (98%) of farm to market roads, 10 km of foot trails, 1 provincial trading center, 164.5 ha covered by communal irrigation systems and 7 units of potable water supply. The rest are still undergoing constructions.	Due to the early closure of IFAD financing, some subprojects were dropped, reducing the RI targets from 133 to 123 km. Out of the 55 subprojects, four (4) access roads were not completed with uneven completion rate and one (1) communal irrigation system. The reasons for the non-completion of the access road are: (i) delayed/suspended deployment and access of construction workers and materials to project site due to COVID-19 pandemic restrictions, delays in procurement and (ii) work suspensions due to rainy weather conditions
At least 25% of local labor for infrastructure will be reserved for local rural women.	MS	12% of the local labor for infrastructure is occupied by local rural women.	Though the hiring of local laborers is open to men and women, only a few applied due to the nature of work and women are mostly involve to management the livelihood activities.
At least 200 livelihood enhancement support (LES) packages operationalized	S	DENR Led 240 (100%) LES packages were signed with POs and are operationalized. 191 (100%) LES3 as incentive for CBFM are completed. DTI Led 52 (100%) shared service equipment delivered and functional 26 out of 28 shared service structures (buildings centers) are constructed or renovated	The two incomplete subprojects of PO Gatud and Tinanang in Kalinga shall be completed using DENR GOP through DTI funds
Component 3			
By 2019, at least 9,000 local beneficiaries trained (i) land use	S	34,028 local beneficiaries trained (PO members, LGUs, DENR staff).	

Output	Rating	Evidence/Examples	Issue/Risk/Action
assessment and URBMP; (ii) land use planning, watershed management and monitoring and REDD and (iii) TE-IEC.			
3b. By 2018, 233 barangays capacitated in developing land management system to reduce carbon dioxide emissions.	S	309 barangays capacitated across the four (4) project sites.	
By 2018, 14 community watershed protection brigades organized with at least 30% female membership	S	110 community watershed protection brigades organized and strengthened.	
Component 4			
By March 2013, one NPCO, four RPCOs, at least four PPMOs and WMPCOs established.	S	Completed	
By June 2013, Project implementation consultants recruited.	S	Mobilized in August 2016 and contract closed on 31 August 2021.	
4c. By 2014, Project M&E, including GIS-based database, established at the NPCO and provincial and watershed units of DENR.	S	PPMS being finalized (with manual on community-based participatory M&E with ESS integrated in the system developed)	
GAP implementation and reporting reflected in quarterly progress reports to ADB	S	100% Achieved. Gender action plan continuously implemented until closing of the project. Last was reflected in 4th quarter 2021 progress report submitted to ADB	

* Monitoring, maintenance and protection of them are continues

a. GEF Grant Disbursement

Reason for delayed disbursement were (i) failure to engage individual consultants; (ii) delayed in the loan activities; and (iii) change in the recruitment of individual to direct contracting of World Agroforestry Centre (ICRAF). ICRAF was mobilized in January 2019 (≃ 6 years after GEF signature of the grant agreement).

The erratic COVID19 further delayed disbursement as implementation of field activities are delayed due to travel restrictions and changing community quarantine status in the sites. In many cases,

activities must be re-scheduled and re-organized (several times), which affected not just the delivery of outputs but also affected utilization of funds.

b. Stakeholders Engagement

A strong partnership has been developed between DENR, LGUs, across the four-river basin as well Department of Trade and Industry (DTI) for Cordillera, Region VII and Region X and Department of Agriculture (DA) for RI in Cordillera. NPCO was actively involved in organizing training and workshop events both at the national and regional levels. In the same way, the regional units– RPCO, PPMO, and WMPCO were influential in the implementation of the field activities. The regional units have encouraged a strong collaboration between field staff. It is expected that this partnership will continue to prosper as the Project implement more capacity-building activities

ICRAF continued to engage DENR and INREMP's team, especially its local counterparts at the regional, provincial, and watersheds/community levels for field activities. ICRAF supported NPCO on the project management level and in harvesting key results that can be mainstreamed in DENR's regular programs. They identified outputs that they believe would be useful in improving DENR's operation (e.g. enhanced CFISP models, PES on watershed services, KoboCollect app, etc.) and provided venue for these to be presented and discussed.

c. Gender Action Plan Implementation Status

This project is categorized as Effective Gender Mainstreaming (EGM). As of 31 December 2021, 72.7% (8 out 11) of GAP targets were achieved. Accounting for women beneficiaries on subsidized inputs was still ongoing at the time of reporting. Details of the status of each GAP indicator, as reviewed by ADB is in the attached GAP document.

d. Social and Environmental Safeguard Plan Implementation Status

The project is categorized overall as "B" for environment. Subprojects under natural resources and managements, and livelihood enhancements are categorized as "C", environment safeguards implications of the subprojects are still required to be assessed.

As of June 2021, about 72% (156 subprojects) are being implemented. Most of the subprojects are compliant with the environmental management plan (EMP). Training on environmental safeguards has been done online for POs on management of wastes of processed commodity crops, handling of fertilizer and proper use of pesticides. Rural Infrastructure, except for trading center, were categorized as B for environment and require initial environmental examination (IEE) reports. There are 45 IEEs prepared and disclosed in the ADB website Nine IEEs are still pending for disclosure ADB website. There are no more outstanding IEEs to be prepared under this project. Environmental Compliance Certificates (ECCs), Certificates of Non-coverage (CNCs), Tree Cutting Permits, and Conditional Water Permits (CWPs) were all secured from relevant government offices.

The project is categorized as "B" for involuntary resettlement and "A" for indigenous people. All 187 applications for Certificates of Precondition (CP), were issued by the NCIP. There is no outstanding IPPs and CMPs to be prepared for the project. The EMA reported that (i) POs/IPOs across the URBs appreciated the usefulness of the CMPs as basis for identifying community's needs and provision of financial assistance from INREMP and other agencies; and (ii) based on interviewed affected persons (APs), the process of donation was free from coercion, meaningful consultations were conducted and options for

compensations were provided and documented. DENR has allocated budget for payment of affected crops and trees. During the reporting period sustainability plans were being incorporated to their CMPs.

Further reports on social safeguards will be validated during project completion mission in Q1 2023.

C. Global Environmental Benefits (GEB) Objective/ Development Objective (DO) Rating:

Development Objective	Performance Targets and Indicators with Baselines	Status/Achievements
Increased rural household incomes and LGU revenues in selected watersheds in the four URBs	By 2020: Rural household income in project areas increased by 30% from 2009 levels (P60,000 – P90,000 per annum)	**Moderately Satisfactory:** The project is already receiving positive feedback from beneficiaries on (i) stable income through partnership with private sector; and (ii) higher market price for their products. However, this might be undermined by the impact of COVID-19 e.g., lower market demand, higher input cost.
	Poverty incidence rate in the project areas decreased to 25% from 47% (2009 baseline)	**Moderately Satisfactory:** Project investments are expected to increase rural household incomes. However, increased household and LGU incomes alone will not lead to poverty incidence rate reduction. The Project is hopeful to overcome this with the increase in productivity especially in agroforestry and tree plantation development.
	Revenues of participating municipalities in the URBs increased by 10% from 2010 income levels (ranging from 30 to 105 million pesos) through project investments in livelihood, biodiversity protection and conservation, and PES	**Moderately Satisfactory:** The rural infrastructure subprojects are already providing easier access for the upland farmers to bring their local produce in the market which can contribute in achieving this target. However, it may not be enough to show 10% increased. Due to limited time that is also further aggravated by COVID-19, piloting of payment for ecosystem services will not be implemented during this project period, though the mechanism has already been put in place by ICRAF.

D. Risk Rating:

Risk	Rating	Explanation for Risk rating	Planned/undertaken risk management/corrective activities
Sustainability of the subprojects introduced under this project.	S	Without project support the interventions specially on natural resources management and livelihood enhancements supporting activities will be discontinued.	Link the PO/IPS to relevant government agencies and private sector for community-based tree enterprises for NTFPs and timber products. Alignment of DENR's forest investment road map to include

Suspension of subproject activities due to General/ Enhanced Community Quarantine for 2-3 months. This may redound to 5-6 months delay including remobilization of manpower and other resources needed.	M	Due to COVID-19, the delivery of activities and assistance to the POs and LGUs are reduced.	

E. Overall Rating of the Project:

A satisfactory rating is currently being provided to this project. Though most of the targets were achieved except for the 5 rural subprojects and 2 shared services facilities, it has yet to be evaluated against its outcome in terms of increase income of the local government and / or reduction of poverty.

Due to limited time that is also further aggravated by COVID-19, piloting of payment for ecosystem services will not be implemented during this project period, though the mechanism has already been put in place by ICRAF.

A more updated and applicable rating will be determined upon receipt of the governments project completion report, upon fielding of the project completion review mission and upon completion of data collection related to economic impact.

F. Additional Comments – Good Practices And Lessons Learned:

Enhanced CFISP demonstration sites as "proofs of concepts". The established learning sites served as learning venues for farmers and local stakeholders to learn about sustainable land management systems as demonstrated in their land use and management practices. Seeing how sustainable land management evolve, and that the development is a stepwise process, farmers who visited the learning sites were encouraged to do the same based on their own needs and aspirations. In Bohol, some POs have developed their own model farms to encourage their members to adopt the same. Although time consuming and expensive, this experience supports that learning site establishment is an important tool to scaling out activities to reach out for more farmers and encourage adoption and investment on sustainable farming systems. The challenge now is to sustain the development of the learning sites and serve its purpose and this require continuous facilitation to keep the farmers' interest and the momentum created by INREMP.

The need to transform POs and IPOs into viable tree-based businesses. The project invested significantly in the NRM component (financial, technical, and human resources), particularly on CFISPs and Livelihood Enhancement Support (LES). While most LES is focused on the development of agricultural and a few on perennial tree products, there remains a need to ensure economic incentives coming from the farms' tree components. While INREMP has focused on the productivity of the CFISPs, it could also help the POs and IPOs by linking them to relevant government agencies and private sector for community-based tree enterprises for fruits, wood, timber, and non-timber forest products. INREMP may also align its sustainability plan on this aspect to the FMB's Forest Investment Road Map, which potential investment areas include (1) forest plantation for timber, non-timber and high value crops such as cacao, coffee and rubber, (2) biomass of renewable energy development, and (3) grazing among others. The long-term success of INREMP depends on the economic incentives

of POs and IPOs to continue to adopt and invest on tree-based land use systems and manage the resources. Clear access and utilization rights, including fair and transparent benefit-sharing agreements, are pre-conditions to this process.

INREMP builds the science-policy nexus. The project provides ICRAF the opportunity to directly share the knowledge generated from various research and development activities in DENR. NPCO introduced and enabled ICRAF to present at DENR-FMB's Executive Committee key results and contribute to their key research and development agenda, such as on enhanced CFISP models, PES and off-line and online M&E through KoboCollect app. It is hoped that these results will influence DENR's related policies and programs on forest landscape restoration like the Enhanced National Greening Program. These engagements and contributions are considered great achievements for ICRAF and the project.

PES business cases as one sustainability measures of INREMP's CFISPs. As shown by the quantification and valuation studies, INREMP's NRM interventions have a positive impact on the sustainability of selected ES when managed properly. While doing so would improve the farms' productivity and profitability, it will also sustain the provision of important ES in the watershed. The development of PES business cases will provide additional (direct or indirect) incentives if these will graduate into a scheme where an ES beneficiary would be rewarded for providing and sustaining an ES that is important to the former. These needs continued facilitation and coordination. Rewards for watershed services development should be seen as an opportunity to develop a more sustainable relationship between ES buyer and sellers rather than an arrangement that needs to be attained or followed. Meanwhile, the adoption of FMB's DAO on PES could be a first step to developing a national PES law in the near future.

Use of digital data collection tool. The use of a digital offline-online data collection tool, particularly KoboCollect, to continue collecting data from the field even in this pandemic time. This is continuously becoming a powerful tool as it reduces the tediousness of data collection, and manual encoding of data
to the database. Especially in this time of pandemic where community quarantines are imposed, the farm progress can be readily observed even with minimal movement. However, the user must be trained, and strong internet connection is necessary when sending the forms to the database. DENR-INREMP has already adopted this tool in their recent socio-economic survey on household income.

Other lessons that were noted in watershed management projects are:

- The support of DENR is critical to expand sustainable upland management systems
- There is a need for change in perspective particularly in valuing ecosystem services particular water to prevent abusive utilization
- PES must be legalized to provide protection to ecosystem services
- PES actors such as buyers, sellers, and intermediates must have in-depth understandings on PES schemes
- The high transaction costs of PES schemes demotivate potential sector to adopt the mechanism
- The Philippines has limited experience on carbon projects. This opportunity can be tapped for future project proposals
- Traditional visual aids are still effective when communicating in infrastructure-limited sites
- Lack of infrastructure hinders success of environmental projects

- Training on community-based monitoring is a necessity in the post-pandemic world
- Farmer-to-farmer interaction can be revolutionary in the watershed management sector

G. Knowledge activities / products:

a. Development of GIS- Database and Modeling Studies on INREMP Impacts

This specific engagement dwells specifically on the use of geospatial-based technologies such as geographic information system (GIS) and remote sensing (RS) not only to develop a geodatabase for project monitoring and serve as input to decision support system but also to conduct capacity trainings. In addition, other relevant studies have been undertaken to highlight the contribution of the project in the improvement of the vegetation in the four upper river basins. Moreover, a predictive modeling of potential forest cover scenarios in the URBs is conducted using transition potential and predictive modeling.

In summary, the various deliverables include the following:

- Conceptual and Detailed Geodatabase Design for Project Performance Monitoring

In this part of the project, the conceptual and detailed geodatabase designs are prepared and developed. This is to augment the geodatabase for base maps that was developed by Geodata System Technologies, Inc. In general, a geodatabase design aims to organize geographic information into various sets of data themes or layers. It starts by identifying the data themes then specifying the contents and representations of each thematic layer. Data themes are also known as thematic layers such as stream network, road network, land cover types, soil texture, elevation, parcels and many others. On the other hand, geographic representations are commonly expressed into various feature classes such as points, lines or polygons. It could also be in the form of satellite imagery or raster datasets, use of continuous surfaces like digital elevation models (DEMs), or using terrain datasets such as triangulated irregular networks (TINs).

- Enhancement in the GDSS Data Management, Maintenance, and Operational Report

This part of the project is aimed at improving the workflow of the INREMP GDSS particularly focusing on the GDSSME geodatabase being implemented at various levels – WMPCO, PPMO, RPCO, and NPCO. The server and other workstations were already purchased and delivered and are already operational and functional. The Geodata Systems Technologies, Inc. has already provided the technical working guidelines on these procedures and these are being used as the primary manual of operations for the different workflows in the INREMP GDSS which include the geodatabase for project performance monitoring.

- Capacity Building/Trainings

In GDSS alone, there were several field coaching sessions being spearheaded by Geodata Systems Technologies Inc. and other similar trainings like the geodatabase for project performance monitoring and the use of the Project Performance Management System or PPMS. The latest coaching session of Geodata Systems Technologies Inc. is held in the 2nd quarter of 2019 and it is entitled “Training Workshop on Advanced GIS for GDSS Operationalization (Part 2)”.

- A Study on Monitoring Land Cover Using Vegetation Indices;

This particular study dwells on the use of remotely sensed images in generating two vegetation indices that aim to highlight measures of vegetation and canopy cover in the different upper river basins. These indices include the Normalized Difference Vegetation Index (NDVI) and Leaf Area Index (LAI). The

Normalized Difference Vegetation Index (NDVI) is one of the most popular vegetation indices that has been used in many ecological and land cover related studies. NDVI is an empirical derived index used to estimate plant biomass through the integration of the red-visible and near-infrared spectral regions to represent plant pigmentation and chlorophyll content, respectively, in the characterization of land cover conditions (Walsh et al., 2001). NDVI also provides information about the spatial and temporal distribution of vegetation communities, vegetation biomass, CO2 fluxes, extent of land degradation in various ecosystems, differentiate ecosystem functional types of biozones, and can quantify the annual net primary productivity, among others (Pettorelli et al., 2005).

The two vegetation indices used in this report are very important indicators in understanding the potential contribution of INREMP, through its NRM subprojects, in the different upper river basins. The NDVI values somehow provide a way to assess plant health and greenness of the vegetation while the LAI values account for the canopy cover and how much foliage is most likely available in the area. Tables 73 and 74 show the positive and negative changes in NDVI and LAI in the different areas where there are NRM subprojects. A positive change is attributed from areas where the previous state or condition is sustained and from areas where there is improvement. For instance, if a given area has a NDVI value of 0.2-0.3 in 2015, and in 2019, some portions of the same area has improved its NDVI values to 0.3-0.4 or higher, then this condition is considered as a positive change. In the same manner, if the area has able to sustain its former state, still this is deemed as positive as well. On the other hand, a negative change implies that the previous state of area has been degraded into a lower state. For example, the NDVI value in 2015 is at 0.4-0.5, but in 2019 most of these areas fell already at NDVI of 0.2-0.3, then this change is deemed as negative. The same is true for the LAI values.

- A Study on Modeling Future Scenarios of Forest Cover for 2025 and 2035

With the Project's aim to improve the forest cover of the four riverbasins, the success of the current effort should not only be assessed by its current contribution but also through its potential future impacts in the area. It primarily uses GIS as a tool to analyze the changes that have happened in an area and use this as input in modeling future land cover scenarios with particular focus on the potential expansion of forest cover in the different upper river basins. The Land Change Modeler (LCM) module of the TerrSet software was applied in analyzing initially the land cover changes that occurred in these four riverbasins. These were then used as inputs in modeling the transition potentials and in predicting future forest cover scenarios in 2025 and 2035. Based on the results, the variables on LULC and NRM sub-projects were found to be the most influential factors in driving the future changes in the forest cover for the two watersheds. Between these watersheds, the highest potential increase in forest cover for 2025 and 2035 is observed in WIRB model with more than 100% increase from 2015. This is followed by CURB (25-50% increase), then BURB (28-47% increase) and finally LLRB (12-21% increase). The results of these analyses may help the policymakers, managers, and land use planners understand the dynamics of land cover and how interventions can possibly manage or sustain a given area.

b. Development of Integrated Project Management Information System (IPMIS)

The consultant during the engagement period was able to produce or develop the following outputs as identified in terms of reference:

- Developed and launched version 2.0 of the DENR Geotagging Camera Application with the following features:
- Security QR code embedded into the photo with information about the contract, name of the contractor, unedited coordinates, date and time taken, and the remarks of the user.
- Watermarking of the taken photos with DENR logo, coordinates, date and time taken, and device accuracy.

The geotagging camera application is being used up to this period not only for the projects of INREMP but in other site monitoring activities in the regional offices of DENR. The consultant is still receiving feedback and requests from the users, especially on the updates and version releases knowing that now android operating systems are continuously updating. Having said that, this would only mean that the application already becomes part of their day-to-day operation, especially in monitoring activities.

- Integration of the Social and Environmental Safeguards Monitoring System - this module allows the social and safeguards specialist to upload the progress of the settlement or any equivalent agreements entered into for both parties the project stakeholders and the project-affected persons. Permits and requirements checklist are also uploaded into this module for monitoring purposes and management decision making.

- Web-Based Mapping System - this module enables iPMIS to render geospatial related data such as dynamic and interactive maps display requested through an API services of the GeoServer. GeoServer is an open-source server written in Java that allows users to share, process and edit geospatial data. Designed for interoperability, it publishes data from any major spatial data source using open standards. Geotagged photos point locations are also layered in the map dashboard of different feature classes of the watershed and subprojects

H. Location Data:

- Upper Chico River Basin lies between 16o49’28” to 17o57’58” north latitude and 120o50’37” to 120o33’14” east longitude.
- Wahig-Inabangga River Basin located between 123o43’0” to 124o37’0” east longitude and between 9o33’0” to 10o12’0” north latitude.
- Upper Bukidnon River Basin 8o00’ and 8”60’ latitude and between 124o35’ and 124o60’ longitude; and
- Lake Lanao River Basin lies between 8o north latitude and 124o east latitude.

Name of Project Officer:	Takeshi Ueda
Position:	Principal Natural Resources and Agriculture Economist
Date:	
Endorsed by:	Jiangfeng Zhang
Division Director	Environment, Natural Resources and Agriculture Division

ANNEX A. Project Contacts

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ANNEX B: DEFINITION OF RATINGS

Implementation Progress Ratings

Highly Satisfactory (HS): Implementation of **all** components is in substantial compliance with the original/formally revised implementation plan for the project. The project can be presented as "good practice".
Satisfactory (S): Implementation of **most** components is in substantial compliance with the original/formally revised plan except for only a few that is subject to remedial action.
Moderately Satisfactory (MS): Implementation of **some** components is in substantial compliance with the original/formally revised plan with **some** components requiring remedial action.
Moderately Unsatisfactory (MU): Implementation of **some** components is not in substantial compliance with the original/formally revised plan with **most** components requiring remedial action..
Unsatisfactory (U): Implementation of **most** components is not in substantial compliance with the original/formally revised plan.
Highly Unsatisfactory (HU): Implementation of **none** of the components is in substantial compliance with the original/formally revised plan.

Global Environment Objective/Development Objective Ratings

Highly Satisfactory (HS): Project is expected to achieve or exceed **all** its major global environmental objectives, and yield substantial global environmental benefits, without major shortcomings. The project can be presented as "good practice".
Satisfactory (S): Project is expected to achieve **most** of its major global environmental objectives, and yield satisfactory global environmental benefits, with only minor shortcomings.
Moderately Satisfactory (MS): Project is expected to achieve **most** of its major relevant objectives but with either significant shortcomings or modest overall relevance. Project is expected not to achieve **some** of its major global environmental objectives or yield some of the expected global environment benefits.
Moderately Unsatisfactory (MU): Project is expected to achieve of its major global environmental objectives with major shortcomings or is expected to achieve only **some** of its major global environmental objectives.
Unsatisfactory (U): Project is expected **not** to achieve **most** of its major global environment objectives or to yield any satisfactory global environmental benefits.
Highly Unsatisfactory (HU): The project has failed to achieve, and is not expected to achieve, **any** of its major global environment objectives with no worthwhile benefits.

Risk Rating

Risk ratings will assess the overall risk of factors internal or external to the project which may affect implementation or prospects for achieving project objectives. Risks of projects should be rated on the following scale:
High Risk (H): There is a probability of greater than 75% that assumptions may fail to hold or materialize, and/or the project may face high risks.
Substantial Risk (S): There is a probability of between 51% and 75% that assumptions may fail to hold and/or the project may face substantial risks.
Modest Risk (M): There is a probability of between 26% and 50% that assumptions may fail to hold or materialize, and/ or the project may face only modest risks.
Low Risk (L): There is a probability of up to 25% that assumptions may fail to hold or materialize, and/ or the project may face only modest risks.