Darwin Initiative Main: Final Report

To be completed with reference to the "Project Reporting Information Note": (https://www.darwininitiative.org.uk/resources-for-projects/information-notes-learning-notes-briefing-papers-and-reviews/).

It is expected that this report will be a **maximum of 20 pages** in length, excluding annexes.

Submission Deadline: no later than 3 months after the agreed end date.

Submit to: BCF-Reports@niras.com including your project ref in the subject line.

Darwin Initiative Project Information

Project reference	28-015
Project title	Delivering public-private partnerships to benefit farmers and biodiversity in Sulawesi
Country(ies)	North Sulawesi, Indonesia
Lead Partner	Wildlife Conservation Society Indonesia Program
Project partner(s)	1. Bogani Nani Wartabone National Park Authority 2. Forestry Agency of North Sulawesi Province 3. Forest Management Unit II Bolaang Mongondow Selatan and Bolaang Mongondow Timur 4. Research and Development Agency of Bolaang Mongondow Selatan District 5. PT Cargill 6. BSIP- Agriculture Research and Development Agency 7. NAM 8. International Coconut Community
Darwin Initiative grant value	£498,467.00
Start/end dates of project	1st July 2021-31st December 2023
Project Leader name	Jeni [redacted]
Project website/blog/social media	
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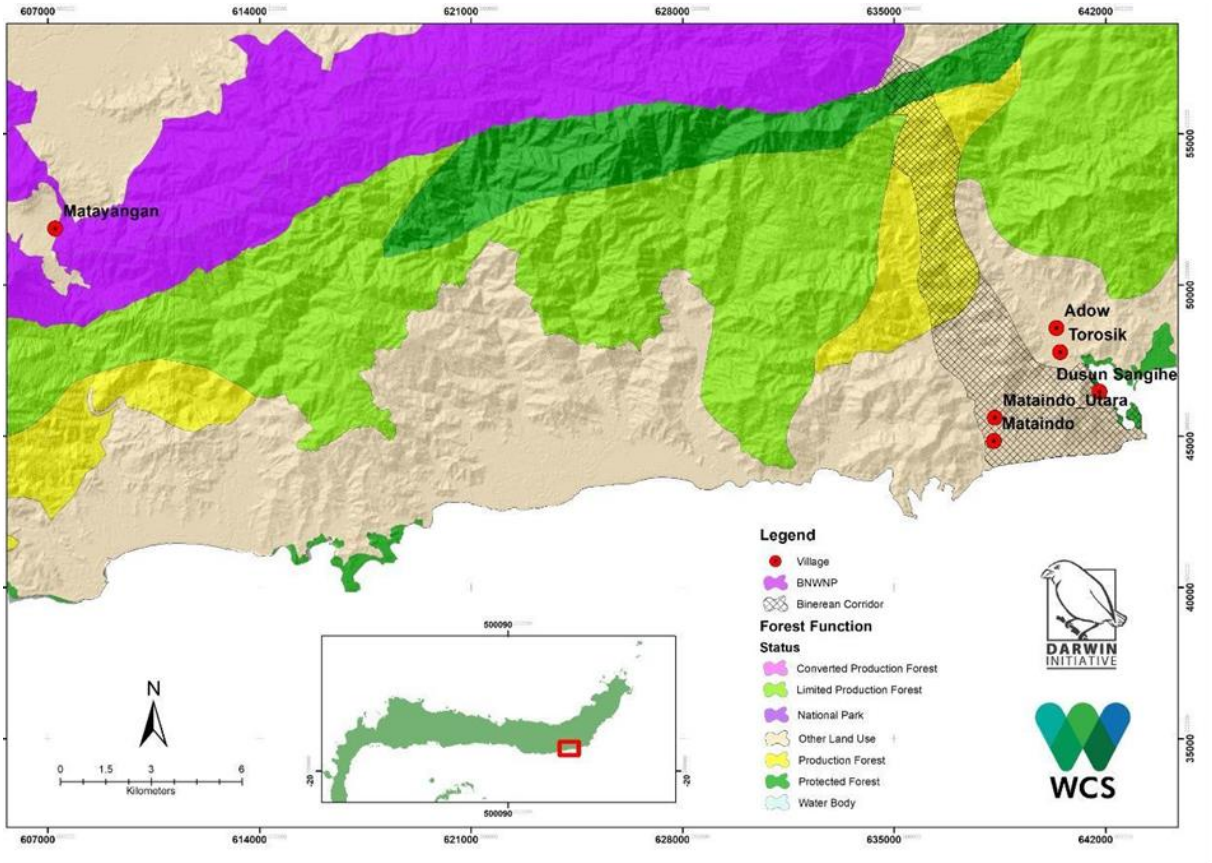
1 Project Summary

Sulawesi island has a remarkable diversity of terrestrial flora and fauna and rich coastal marine life. The focal landscape for the project is Bogani Nani Wartabone National Park (BNWNP) (2,871 km^2) - Sulawesi's largest protected area - and its southern buffer zone, which comprises part of a Forest Management Unit II (FMU II; 1,394 km^2), including the gazetted Binerean wildlife corridor (Figure 1). The Binerean Corridor is located in Pinolosian Tengah District, South Bolaang

Mongondow Regency (Bolsel). This landscape provides habitat for a number of endemic and endangered species including lowland anoa (*Bubalus depressicornis*), maleo (*Macrocephalon maleo*) and the black-crested macaque (*Macaca nigra*) and vital ecosystem services for the communities in the surrounding area, including in the 5 pilot villages (Mataindo, Mataindo Utara, Torosik, Adow, and Matayangan) (Figure 1). This landscape is particularly important for Maleo, as the corridor connects habitat inside the BNWNP and nesting sites at the coast. Of the 36 known Maleo's nesting sites in the North Sulawesi Province, approximately 50% are abandoned, and the global population is now estimated at fewer than 5,000 birds.

The landscape's forests are bordered by rural farming communities, who mainly grow coconuts to produce copra. The dynamics of land ownership and management, whereby collectors frequently manage coconut plantations and farmers themselves grow crops in additional areas, combined with falling yields from old coconut trees and low market prices for copra over the past decade, means that many farmers have cleared new forest areas to plant other crops. This is leading to increased conversion of biodiversity-rich forests, threatening connectivity for key wildlife. At the same time, conversion degrades critical watershed forest; increasing flooding risks for communities farming in the landscape.

In 2022, Bolsel's population was 66,071 people[1], with more than 50% relying on farming (primarily coconuts) for their main source of income. Bolsel has the lowest Human Development Index in North Sulawesi (65.3 vs provincial average 73.0), and most farmers live on an average income of <GBP110/month.



Source: WCS-IP

Figure 1. The five pilot villages in and around the Binerean corridor.

WCS has a good understanding of the challenges in this area, having been active in the landscape since the late 1990s. Preliminary supply chain assessments by WCS prior to project initiation identified some of the challenges facing farmers and identified opportunities to improve

[1] North Sulawesi Statistical Bureau, 2022

yields and supply chain sustainability for buying companies, including PT Cargill, which is the main buyer of copra in the region.

Through a community, government and private sector partnership, the project aimed to support coconut farmers, reduce forest threats and restore critical watersheds in North Sulawesi. Community conservation commitments alongside agricultural training aimed to support more biodiversity-friendly production and improve farmer livelihoods through higher yields and income diversification. Forest restoration and more diverse farming systems aimed to reduce flooding risks. Finally, collaborative management between government and communities, underpinned by robust monitoring, aimed to ensure the protection of forests and biodiversity in the landscape, and demonstrate a scalable model for the region.

In the short-term, the project aimed to improve rural livelihoods through community engagement and training for >500 farmers. This sought to support the uptake of more sustainable agricultural practices. It was expected that direct beneficiaries would experience improved well-being, and up to a 10% increase in household income. Training for participating farmers aimed to provide long-lasting benefits beyond the project lifespan and to a wider group within the community through learning exchange.

The implementation of the co-management plan and improved capacity of FMU staff, community-government patrol teams, and improved community awareness were expected to reduce habitat fragmentation, poaching and other threats to biodiversity, and initiate habitat restoration in the short-term. This aimed to support the protection of the four priority MoEF species that are endemic to Sulawesi: lowland anoa (*Bubalus sp*.) (EN); babirusa (*Babyrousa celebensis*) (VU); black-crested macaque (*Macaca nigra*) (CR); and, maleo (M*acrocephalon maleo*) (EN), increasing population trend trajectories by at least 10% (relative abundance and/or occupancy) in the project time-frame. Further benefits to biodiversity are anticipated as restoration activities progress and FMU management continues into the future, supporting enhanced landscape connectivity and recovering former parts of species' ranges. At the same time, support for improved farmer livelihoods through more sustainable and resilient agricultural practices and the development of conservation agreements was expected to reduce deforestation by at least 20% within the project timeframe, leading to longer-term benefits as deforestation-free agricultural production demonstrated benefits over forest clearance. The co-management plan was expected to provide a strong foundation for longer-term collaboration among stakeholders led by the government, to support the conservation of this critical landscape.

2 Project Partnerships

WCS has led on and coordinated the delivery of the project in partnership with government, community and private sector partners. This included leading on the development of a landscape assessment framework and monitoring system; developing and delivering a farmer training and capacity building programme, and facilitating the development and adoption of the co-management model for the landscape with key government, private sector, and community stakeholders. Partners have been involved in different aspects of the project throughout:

- North Sulawesi Natural Resources Conservation Agency (BKSDA Sulawesi Utara; BKSDA Sulut): WCS operates in Indonesia under the Memorandum of Understanding with Indonesia's Ministry of Environment and Forestry (MoEF) and works collaboratively with MoEF's technical implementation unit in North Sulawesi, which are BKSDA Sulut and BNWNP Authority. BKSDA Sulut is responsible for managing the conservation area in the North Sulawesi province and conserving wild flora and fauna both inside and outside of the state forest areas. We have a Program Implementation Plan and Annual Working Plan with BSKDA Sulut, including for this project; BKSDA therefore has been involved in project planning and decision making through the annual working plans and continuous engagement throughout the project. In line with its mandate, we have worked closely with BKSDA Sulut in conserving the key species in this landscape, especially in the Binerean corridor which is located outside the national park. BKSDA Sulut has also played a key role in decision making and in coordinating the Ecosystem Essential Area Forum (Forum Kawasan Ekosistem Esensial/KEE), a governance structure that oversees the management of the Binerean Corridor. (See also Bappelitbangda Bolsel below).

- Bogani Nani Wartabone National Park (BNWNP) Authority: As above, WCS has a Program Implementation Plan and Annual Working Plan with BNWNP Authority. Since 1991, WCS has been supporting the BNWNP Authority in conserving flagship species in the national park. Together with the BNWNP Authority, we continue conducting forest patrols and monitoring forests and biodiversity. The BNWNP Authority has been involved in project planning and decision making through the annual working plans and continuous engagement throughout the project. In particular, the BNWNP Authority has led discussions with Provincial and District Governments on the empowerment of the communities in buffer zone areas to support their transition to producing biodiversity-friendly commodities. Together with BKSDA Sulut, BNWNP also plays a key role in the implementation of co-management plans in the landscape.
- Bolsel District Government: Ecosystem Essential Area (KEE) is mandated in Government Regulation 28, 2011 (Article 24) concerning Management of Natural Reserve Areas and Nature Conservation Areas (with reference to Law Number 23, 2014). Standard guidelines for management have been regulated by the Directorate General of KSDAE (Nature Resources and Ecosystem Conservation), requiring a higher Ministerial Regulation. In the absence of this, the district government is the owner of, and holds management rights for, regional natural resources and areas with high ecosystem value. The KEE area is therefore being managed without changing the status of existing land rights. Initially, it was planned that MoEF would have full authority in making decisions over the KEE. However, as the MoEF Regulation has not been ratified, the KEE Forum and area are the direct responsibility of the regional government. For KEE Binerean, the existing KEE Forum continues to function and a Regional Regulation regarding the protection of animal corridors has been developed by the Bolsel District Government and pursuant to the Law regarding the Local Government (Law No. 23/2014), the area has been designated as the wildlife migratory area. As such, they have been a key partner throughout in the coordination and decision making associated with the Binerean Corridor.
- Forestry Agency of North Sulawesi Province: In this project, the Provincial Forestry Agency provides the forest administration framework for all project interventions in the Production Forest Management Unit II, which is in the buffer zone of BNWNP. They are therefore the key decision-maker for this area and for all project aspects relating to FMU II.
- Forestry Management Unit II - Bolsel-Boltim (FMU II): WCS collaborates with FMU II Bolsel-Boltim in implementing joint SMART patrol activities in the FMU II area. They have also been leading in the identification of potential areas for restoration and in the development of a restoration plan through a social forestry scheme. FMU Unit II is also part of the KEE Forum that leads in the development and implementation of co-management plans in the landscape.
- The Research and Development Agency of Bolsel District (Bappelitbangda Bolsel): Bappelitbangda Bolsel have been key partners in the design and implementation of the socio-economic survey. Bappelitbangda is the leading agency within the Bolsel District Government on any discussion related to Forum KEE, including incorporation of the Ecosystem Essential Plan and Roadmap into the District Development Plan.
- PT Cargill: As a major buyer of copra from the landscape, Cargill faces sourcing risks from continued forest conversion and associated with farmer livelihood and productivity challenges. This partnership provided the opportunity for Cargill to mitigate its sourcing risks, whilst contributing to its sustainability goals. Cargill has been a key partner in both the design and implementation of the project. Through discussions around their co-financing, they were initially involved in design, and subsequently have been collaborating to provide technical assistance for the farmers. Through this, they have supported the design and delivery of training on Good Agricultural Practices (GAP). Cargill has also been actively involved in the KEE Forum, providing input from a private sector perspective and, as a member, playing an active role in the management of the ecosystem essential area in the long term. In the discussion with Bolsel District Government, Cargill committed to support farmers through their corporate social responsibility program, and has indicated a willingness for continued support into the future.
- Manado State Polytechnic (Polimdo): Polimdo led the design and analysis of the coconut value chain research and analysis in the project. In identifying several challenges and opportunities associated with the current value chain, Polimdo has identified several areas of support for farmers, including applied technology for agricultural activities.

- Agricultural Instrument Standardisation Agency (BSIP): BSIP has the overall responsibility of coordinating, formulating, implementing, maintaining, and harmonising the standard of agricultural instruments. BSIP runs a palm research centre in Manado and has been an important partner in providing training for farmers on GAP and the development of coconut derivative products. BSIP also developed high quality coconut seedlings that resilience to environmental and climate change, which has been distributed to the facilitated farmer in our project site.
- Non-Aligned Movement Centre for South South Technical Cooperation (NAM CSSTC): NAM CSSTC contributes to the acceleration and enhancement of national development by strengthening and expanding South-South technical cooperation in the context of international development cooperation. NAM CSSTC holds seminars on tissue culture techniques for coconut plants, aquaculture training, international certification training for coconut development officers, international symposiums/ seminars on vegetable oil, and training for women and youth entrepreneurship. The Bolsel District Government submitted a proposal to NAM CSSTC requesting their support to strengthen farmer capacity on the development of coconut business. In response, NAM CSSTC requested that Bolsel District Government conduct a situational analysis of coconut potential in the district, to be funded by NAM CSSTC. NAM CSSTC is therefore an important strategic partner for the continued and future development of a resilient sustainable coconut sector in Bolsel District.
- International Coconut Community (ICC): ICC is an intergovernmental organisation of coconut producing countries. ICC currently has 21 coconut producing member countries accounting for over 90% coconut production and exports of coconut products. ICC collaborated with BSIP and NAM on supporting the management of the Binerean Corridor through a 'Coconut for Maleo' scheme[2]. ICC also supported the development of the Sustainable Coconut Roadmap in Bolsel District with a focus on the Binerean corridor. ICC also invited WCS as a key speaker on World Coconut Day in Gorontalo to disseminate the project progress and lessons learned, and outputs from other partners such as BNWNP Authority, BSIP Palma, BKSDA and Cargill. ICC has also participated as a keynote speaker in the KEE Forum.
- Sam Ratulangi University: In collaboration with the Forestry Science Study Program of Sam Ratulangi University, WCS facilitated biodiversity research by undergraduate students while also conducting research on species and conservation area management. This contributed to ensuring the continuity of conservation research in the landscape and enhanced the application of science-based approaches.
- Sustainable Coconut Partnership (SCP): Whilst not a key partner in the project, we were invited to join the Sustainable Coconut Partnership workshop in Jakarta on 20th November 2023. They developed three working groups on transparency and traceability, low carbon and regenerative agriculture, and the landscape approach. As the SCP is relatively new, we see good opportunities for continued engagement and for this landscape to be a pilot for landscape approaches in the coconut sector. We continue engagement with SCP stakeholders such as Cargill, JDE, ICC, AFi, Proforest, GIZ, DICE, and Barry Callebaut, amongst others, and will continue to explore opportunities for collaboration beyond the project timeframe.

[2] Combining sustainable coconut production and maleo conservation in the Binerean corridor.

3 Project Achievements

3.1 Outputs

Output 1: An assessment framework and monitoring system is established across the landscape, enabling the BNWNP and FMU authorities and the multi-stakeholder partnership to implement and adapt approaches within a forest management strategy that integrates forest protection, restoration and sustainable agricultural production.

Activity 1.1. Develop biodiversity, farmer socio-economic, flooding and deforestation indicators in c*onsultation with project stakeholders*

We have developed indicators for biodiversity, farmers (socio-economic data), flooding and deforestation. These have been identified in consultation with project stakeholders, including BKSDA Sulut and BNWNP Authority (as key implementing agencies of KSDAE/MoEF) and Bappelitbangda Bolsel.

Key indicators for biodiversity developed in collaboration with BKSDA Sulut and BNWNP Authority include:

- Populations of MoEF key species: Anoa (*Bubalus depressicornis*), Babirusa (*Babyrousa celebensis*), Maleo (*Macrocephalon maleo*) and black crested macaque (*Macaca nigra*)
- Mammal and primate presence
- Vegetation structure and composition

Key socio-economic indicators were developed in collaboration with the Bolsel District Research and Development Planning Agency (Bappelitbangda Bolsel) through a survey carried out in 2022, including to assess:

- Community's education, main livelihoods, incomes, expenditure, participation in natural resource management, perceptions of environmental changes, land ownership, agricultural activities and relevant crops, etc.

Indicators for flooding and deforestation established and assessed through two complementary analyses, in collaboration with the BNWNP Authority (including during a Focus Group Discussion (FGD) in March 2022 with the BNWNP Authority in Kotamobagu):

- Sedimentation and associated parameters affecting erosion (land cover, rainfall, topography, soil type)
- Forest and Land Cover change
- High Conservation Values (HCV), conducted via a landscape-level participatory HCV assessment, identifying HCV areas, pressures and threats.

Link to the means of verification: [redacted]

Activity 1.2. Develop a land-use monitoring system to establish farmland, forest and flooding risk baselines, identify priority areas, create deforestation alerts and monitoring project progress

We established forest and land use change, farmland and flooding baselines and monitored progress throughout the project. The deforestation baseline across the landscape (2015-2020) was 10,508 hectares of forest loss with an annual deforestation rate across the landscape of 0.33%; and for BNWNP (2015-2020) was 1,566 hectares of forest loss with an annual deforestation rate of 0.11%.

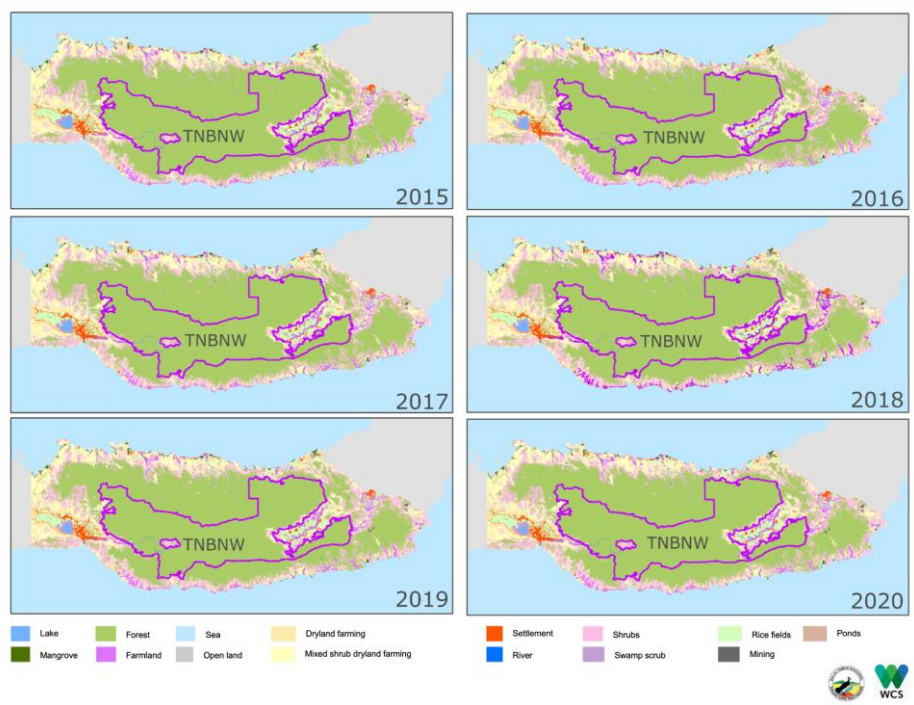


Figure 2. Forest and land cover change of BNWNP and surrounding area (2015 - 2020)

From our analysis, there was a 24% reduction in deforestation rate in the landscape (from 0.33%/year in 2015-2020 to 0.25%/year in 2020-2021).

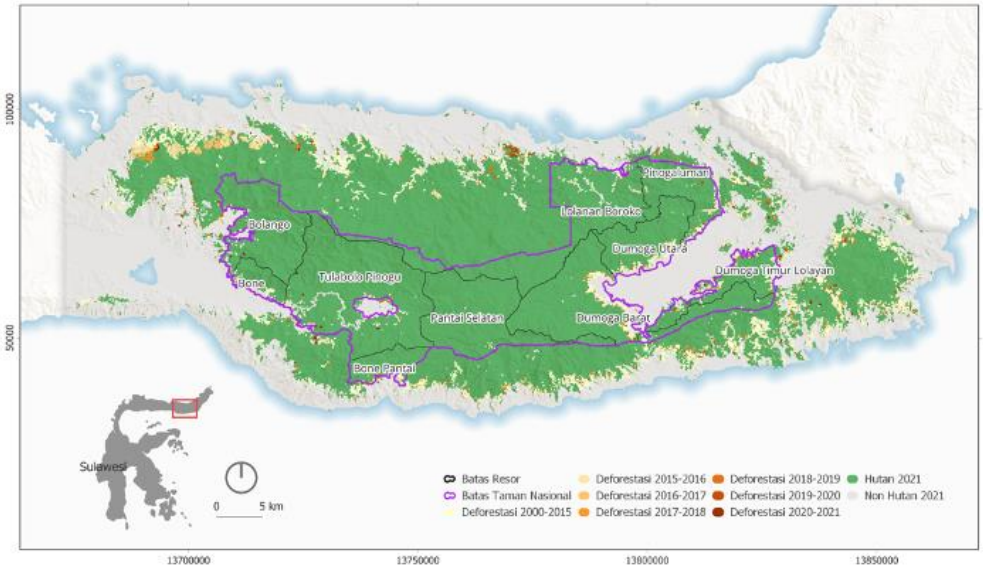


Figure 3. Forest and land cover change of BNWNP and its buffer zone (2000 - 2021)

In addition, we empowered the national park staff to independently conduct remote sensing data analyses by providing training in Year 2 (September 2022) and continuous mentoring thereafter. Currently, the analyst team is actively involved in analysing remote sensing images to create a preliminary land cover map for 2022. The imagery has been pre-processed, stacked, and downloaded. However, due to weather conditions in 2022, we could not obtain a fully clear image for the entire area. The team has conducted initial analysis to identify indications of deforestation, although quantitative calculations have not yet been finalised (Figure 4). Figure 4 illustrates indications of deforestation within the national park area, notably in the Dumoga Barat (A), Pinogaluman (B), and Dumoga Utara Resort (a resort is the smallest management unit within the national park). Additionally, indications of deforestation are observed along the outer border of the Bone Pantai Resort (D). Furthermore, across the entire landscape, the most notable signs of

deforestation appear in the west of the Bolango Resort (E), potentially linked to agricultural expansion, and the east of the Dumoga Timur Lolayan Resort, potentially related to mining activities. However, while progress has been made, it is important to acknowledge that an extended timeframe is necessary to complete the work. Nevertheless, the investment in training and building local capacity represents a significant step towards the project's sustainability.

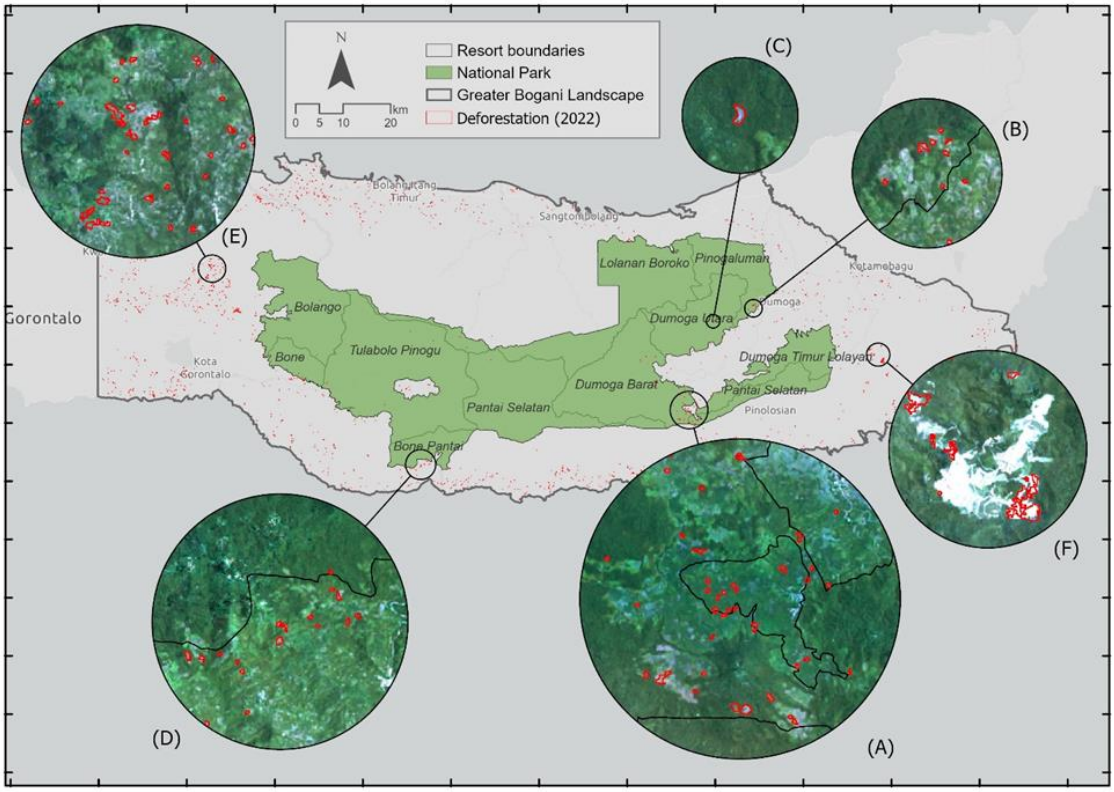


Figure 4**.** Spatial distribution of indicative deforestation (2022) in Bogani Nani Wartabone National Park and its buffer zone, all maps in insets are at the same scale.

We established farmland baselines using a participatory approach, registering farmers and mapping their land in and around the Binerean corridor. This involved:

- Participatory mapping training for communities in four pilot villages (December 2022). Twenty people participated in the training, which included training on farm sketches, mapping, GPS-use for polygons vs data points, etc.
- Farmers mapping their farmland (following the above training) across a total of 1,212 farm plots owned by 926 farmers (372 plots in Mataindo, 85 plots in Adow, 314 plots in Torosik, 287 plots in Mataindo Utara and 154 plots in Matayangan Village).

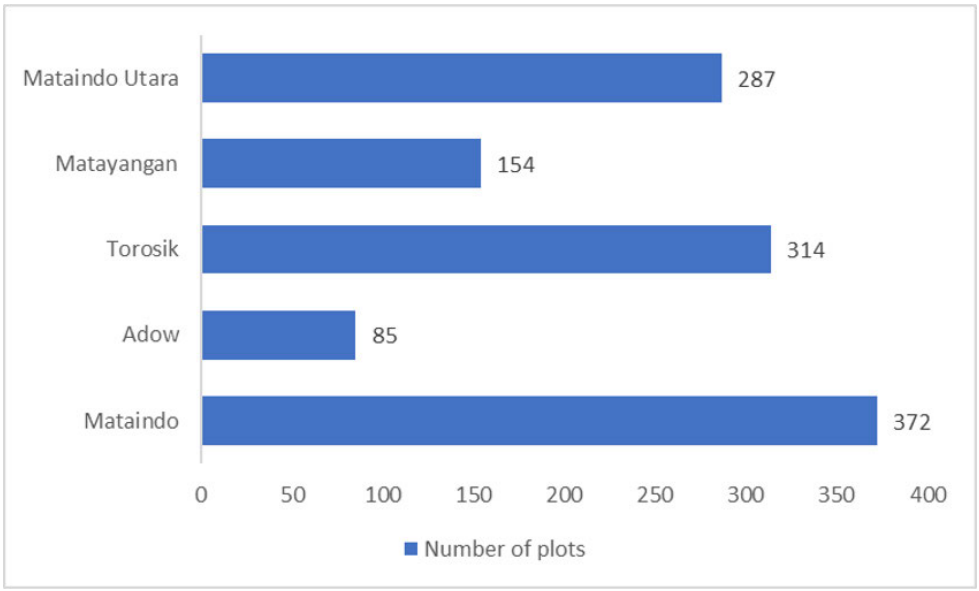


Figure 5. Farm mapping in assisted villages

We carried out a sedimentation analysis that revealed that land cover, including changes caused by human activities, was found to be critical in influencing sedimentation. Relative to other parameters (soil type, topography, rainfall), land cover represents the main opportunity for intervention. Combined with the deforestation analysis, this revealed that areas under coconut farming and other agricultural production have a high risk of sedimentation compared to forests, old secondary forest and shrubs. This is particularly important to consider for areas of coconut or other farming on steep slopes, which will contribute significantly to sedimentation and run off. These areas are priorities for interventions, in terms of either restoration or the introduction of terraced farming.

Finally, we supported the BNWNP Authority to develop an Integrated Information System for Bogani Nani Wartabone (*Sibonawa*: https://www.sibonawa.org/login), using the SMART engine. We trained BNWNP staff to operate this information system and analyse data and information collected. The system integrates data and results from the SMART patrol activities, biodiversity monitoring, resort-based management, and relevant data and information to inform the decision making process of BNWNP management.

Link to the means of verification: MoV 1.2.

Activity 1.3. Conduct biodiversity surveys and assess trends of priority species and their forest habitat across the landscape

Surveys to assess biodiversity and trends of four priority MoEF species and their habitat were conducted via camera trap surveys and through a permanent site for biodiversity monitoring in the Binerean Corridor.

Camera trap surveys were conducted in collaboration with the BNWNP Authorities to assess the populations and habitat condition of four key species in the landscape, including lowland anoa (*Bubalus depressicornis*), babirusa (*Babyrousa celebensis*), maleo (*Macrocephalon maleo*) and the black-crested macaque (*Macaca nigra*). These surveys were carried out in the BNWNP and areas designated for other land uses (Area Penggunaan Lain), including in the Binerean corridor. Surveys were conducted in Year 1 to compile baseline data and repeated in Year 2 (June-October 2022) and Year 3 (April 2023). Analysis involved species identification and metadata tagging for every photograph (>10,000 photos) obtained from the surveys.

The breeding population for maleo increased from 13 pairs in 2021 to 18 pairs in 2022 and 24 pairs in 2023 (see Table 1). The estimated occupancies of anoa and babirusa also demonstrated increases from 2021 to 2023.

The estimated occupancy of anoa in 2021 was 0.53 (95% Confidence Interval; CI 0.34-0.73; Standard Error; SE=0.09). This remained similar between 2021 and 2022 (due to overlapping confidence intervals) and increased to 0.70 in 2023 (95% CI 0.58 – 0.78; SE= 0.10) (Table 2) (demonstrating >32% increase compared to the baseline in 2021).

The estimated occupancy of babirusa in 2021 was 0.61 (95% CI 0.43-0.71; SE=0.08). This remained similar between 2021 and 2022 (due to overlapping confidence intervals) and increased to 0.74 (95% CI 0.61 – 0.78; SE=0.10) (Table 2) (demonstrating >21% increase compared to the baseline in 2021).

Table 1. Survey results for maleo (*Macrocephalon maleo*)

Year	Breeding population (number of pairs)	SE
2021	13	0.09
2022	18	0.08
2023	24	0.08

Table 2. Occupancy survey results for Anoa (*Bubalus depressicornis*) and Babirusa (*Babyrousa celebensis*)

Species	Year	Prob occupancy	Lower	Upper	SE
Anoa (*Bubalus depressicornis*)	2021	0.53	0.34	0.73	0.09
	2022	0.65	0.52	0.71	0.11
	2023	0.70	0.58	0.78	0.10
Babirusa (*Babyrousa celebensis*)	2021	0.61	0.43	0.71	0.08
	2022	0.57	0.41	0.68	0.09
	2023	0.74	0.61	0.78	0.10

The permanent site for biodiversity monitoring includes 36 Variable Circular Plot (VCP) stations for estimating bird populations, six line transects for mammals and primates, and 36 plots to assess vegetation structure and composition. This has been established and operates in collaboration with the local community. Youth representatives have played an important role, having been trained in data collection and establishing the basis for their participation as research assistants in the future.

In December 2023, the survey result showed species richness in the Binerean study area as many as 73 bird species. The highest species richness is in the forest habitat type with 57 species, followed by 39 species in agricultural land, 21 species in shrubs, and 23 species in wetlands/swamps (see Figure 6).

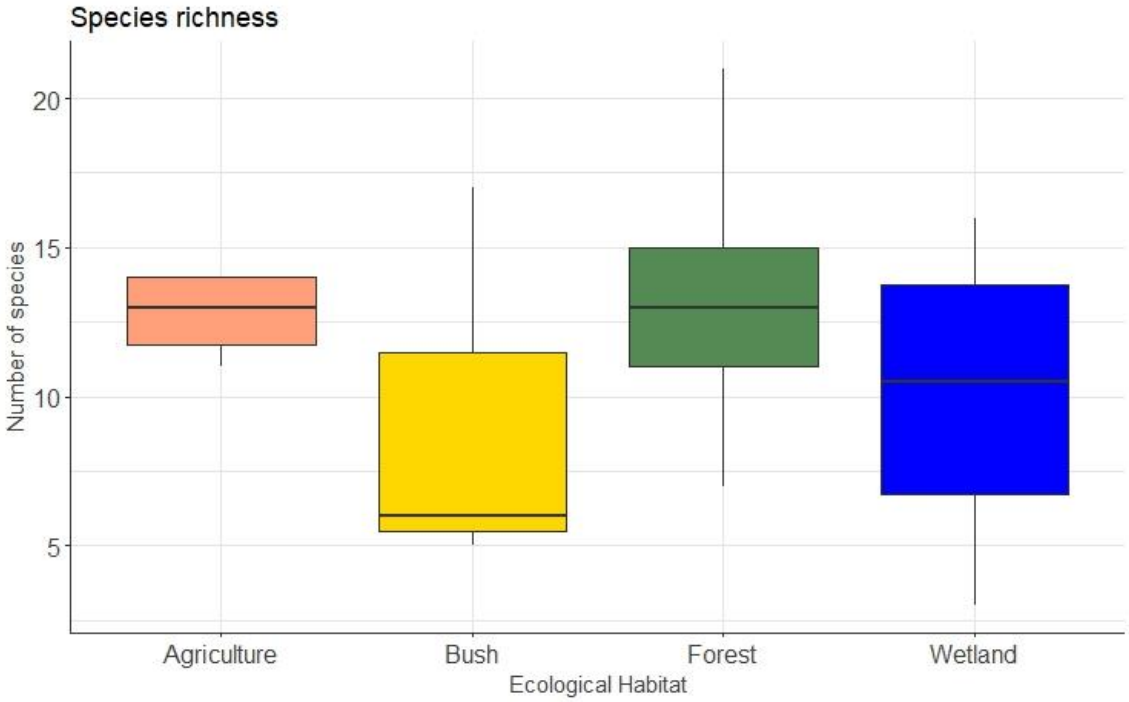


Figure 6. Species richness in various habitat types in Binerean

Shannon Wiener's diversity analysis showed that bird communities in forest habitat types were high (H'=3.43), and that bird communities in agricultural habitats also had a high diversity index (H'=3.23). Habitats that have diverse vegetation types will provide more types of feed, so there will be more feed choices for birds. Wetland and shrub habitats have moderate diversity values (2.96 and 2.84) (See Figure 7).

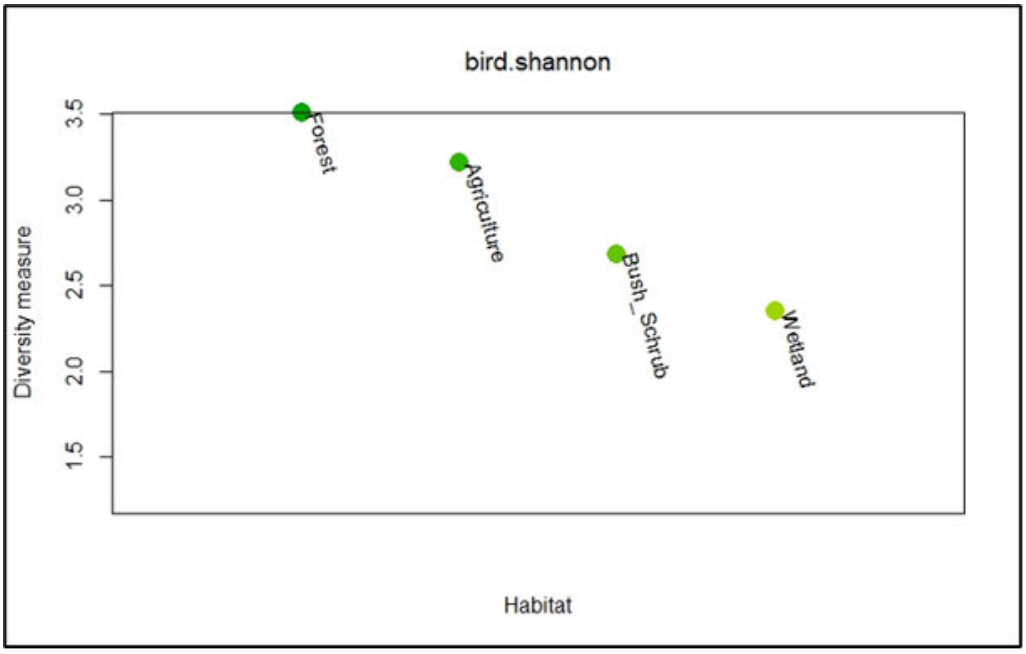
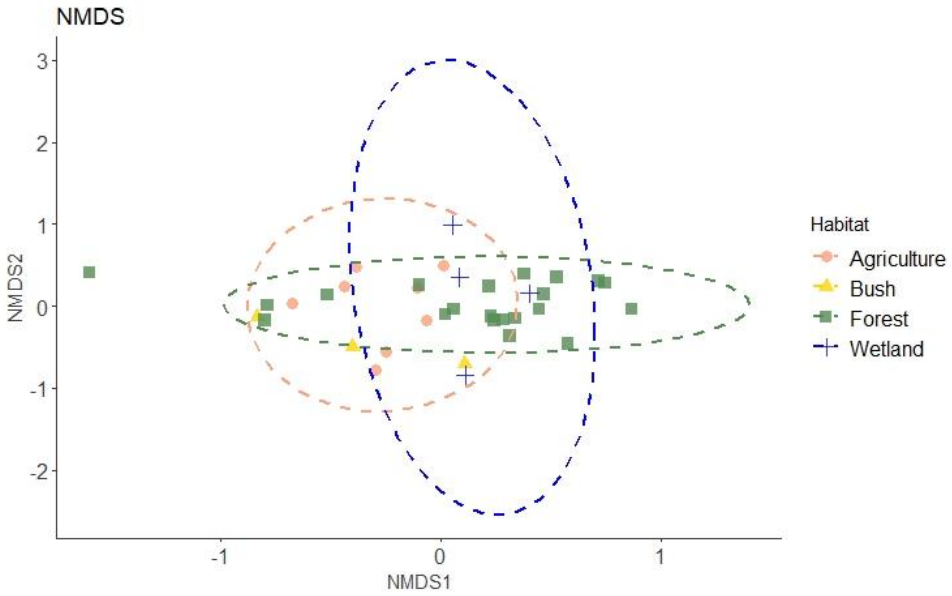


Figure 7. Bird diversity in various habitat in Binerean

We also assessed beta diversity to compare biodiversity between ecosystems/habitat types (Whittaker, 1960). The results of the analysis showed that bird diversity between forest and shrub habitat types had a fairly high type of similarity (0.74). This was likely due to the proximity of the surveyed bush/scrub habitat and forest.

Table 3. Similarity composition between communities or ecosystems



Link to the mean of verification: MoV 1.3.

1.4. Conduct farmer surveys to assess socio-economic conditions of farmers across the landscape

An initial socio-economic survey was carried out from March to April 2022 in seven villages (Mataindo Utara, Tobayagan Selatan, Deaga, Adow, Mataindo, Torosik and Iligon) with a total of 425 respondents (including 260 men and 165 women) and 21 key informants. Data and information collected included demography, settlement patterns, community education, livelihood activities, average incomes (see Table 4), farming and fisheries activities, social institutions and infrastructure, illegal practices in the utilisation of natural resources, knowledge and perception toward forest and biodiversity conservation.

The age range of respondents was from 18 to 65 years. The formal education of female respondents was found to be higher than that of male respondents. Most respondents were farmers (who typically own their own land) and the main crops/trees of economic value identified included cloves, coconut, cocoa, and coffee, with intercropping such as chilli, maize, tomato, and vegetables. Most of the respondents said that they experience wildlife conflict in their land, including with wild boar, black crested macaque (yaki) and rats. Most of the respondents knew rules regarding the wildlife protection. There were few respondents who were members of farmer groups or cooperatives and few who had received any training or assistance related to agricultural activities.

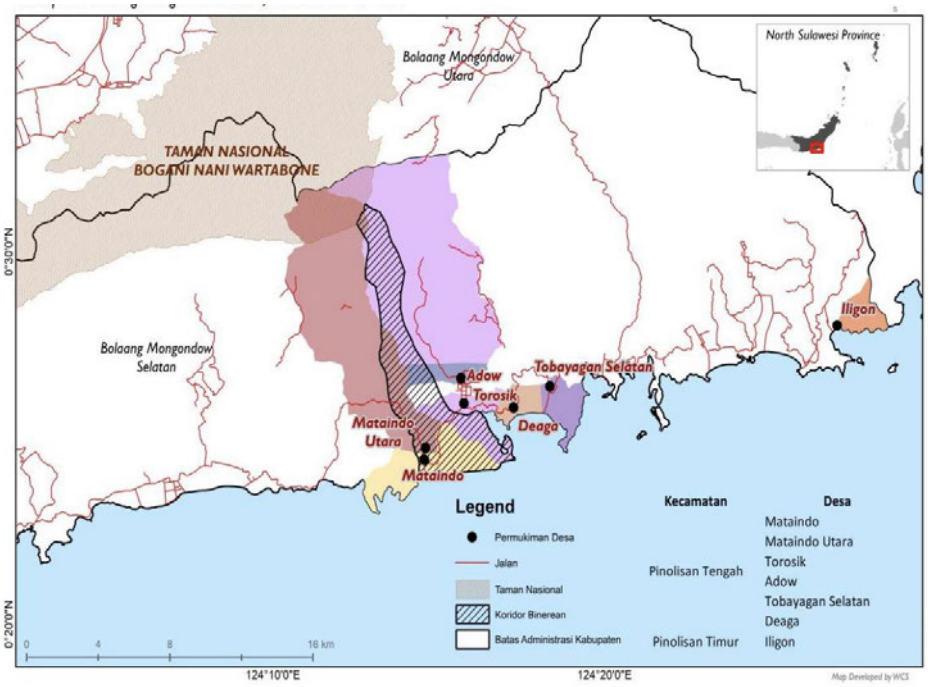


Figure 8. Location of villages for socio economic

At the end of 2023, a second survey was conducted by the BSIP Palma team. In this survey, 60 household respondents and 4 key informants were interviewed. Around 70% of respondents were farmers, while others are fishermen or gold miners, with most farmers owning their land. This assessed average incomes and expenditures for each village (Table 4). We also asked respondents about forest encroachment. This found that the number of participants who have conducted forest encroachment to open plantation plots in the last three years was 0% in Adow; 6.67% in Torosik; 20% in Mataindo and 40% in Mataindo Utara. Most respondents carried out forest encroachment for agricultural land to be planted with annual and seasonal crops. Communities from all four villages have knowledge on protected wildlife and reported an understanding of the reasons for forest conservation (including to reduce the threat of extinction for wildlife, for maintaining ecosystem balance, and to adhere to government regulations). Most of the respondents within the area were aware of regulations regarding protected wildlife, and could list protected species including maleo, wild boar, deer, macaques, turtles, hornbills, and anoa.

Data on the percentage of respondents who have carried out forest encroachment to clear plantation land over the last 3 years, namely 0% in Adow village (no one has carried out forest encroachment to clear land in Adow village over the last 3 years), 6.67% in Torosik village, 20% in Mataindo village, and 40% of Mataindo Utara village. Most respondents carried out forest encroachment to clear agricultural land to be planted with annual and seasonal crops.

Table 4. The average household income and expenditure in 2022 and 2023 from the pilot villages.

Village	Average Household Income in 2022 in IDR (GBP)	Average Household Expenditure in 2022 in IDR (GBP)	Average Household Income in 2023 in IDR (GBP)	Average Household Expenditure in 2023 in IDR (GBP)
Adow	1,643,860 (81.87)	1,227,222 (61.12)	1,686,677 (84.00)	1,713,333 (85.33)
Mataindo	1,321,795 (65.83)	1,279,204 (63.71)	2,650,000 (131.98)	2,666,666 (132.81)
Mataindo Utara	1, 118,658 (55.71)	1,575,000 (78.44)	1,733,333 (86.33)	1,850,000 (92.14)
Torosik	1,143,939 (56.97)	1,314,130 (65.45)	2,800,000 (139.45)	2,733,333 (136.13)

Comparing the two surveys shows an increase in average farmer incomes, insignificant in some villages at <10% but at >100% in others. However, around 50-60% of the farmers in the landscape are still living below the poverty line, and minimum incomes were found to be just 500-800,000 IDR/month (around GBP 25-40). Each household in the landscape consists of a minimum of 3-4 people. Meanwhile the poverty line threshold in Bolaang Mongondow Selatan is IDR 345,819 per capita/month (GBP 17.22). Looking at the level of household expenditure, the majority of farmers are not able to save their money.

Link to the means of verification: MoV 1.4.

Output 2: >500 smallholder farmers in Bolsel are committed to forest protection and restoration, and have viable livelihoods from sustainable agriculture practices, supported by a multi-stakeholder partnership

Activity 2.1. Engage government, private sector and community stakeholders to establish a multi-stakeholder forum that develops a strategy for integrated forest protection, restoration and sustainable agricultural production

At the beginning of the project we had planned to establish a new multi-stakeholder forum in order to develop a strategy for integrated forest protection, restoration and sustainable agriculture production in the landscape. However, following our assessment, we decided to strengthen an existing forum for the collaborative management of the Ecosystem Essential (KEE) Wildlife Corridor of Tanjung Binerean, which was established in 2019 based on the Decree of Bolaang Mongondow Selatan Regent No. 289/2019.

Initially, the members of this forum included representatives from BNWNP, BKSDA Sulut, key local government agencies related to natural resources management, the Head of Sub-districts and Village Heads, local CSOs and WCS. In 2022 we facilitated discussions between the forum and the private sector, namely Cargill, and other relevant stakeholders that focus on the development of a sustainable coconut sector, such as BSIP, International Coconut Community

and Forestry Faculty of Sam Ratulangi University. Cargill and BSIP are now part of this collaborative forum.

Until now, this collaborative forum has played an important role in bringing together relevant stakeholders in the landscape to continue to communicate and define the best strategy to support the protection of key species and their habitat in the landscape while ensuring the sustainable production of wildlife-friendly agricultural commodities.

Link to means of verification: MoV 2.1.

Activity 2.2. Conduct farmer needs assessment, including knowledge and application of GAP, farmer organisation, assessment of access to inputs, markets and finance

To improve our understanding of farmer needs, we conducted FGDs in the five pilot villages with 392 participants (246 men and 146 women). The key findings were that the majority of farmland is still productive but farmers tend to not intensively manage their land; farmers have implemented intercropping in the past but that it requires intensive assistance; most still use conventional farming techniques due to lack of funding and limited access to market; in general, incomes are unable to meet daily needs; women participate by planting and selling nutmeg, clove, and chilli and other crops; farmers are using chemical pesticides less frequently because they are hard to get and expensive. The FGD also revealed that farmers have established several farmer groups in order to get access government assistance, but that, in reality, these groups are inactive.

The result of the farmer needs assessment informed the formulation of the GAP+ training curricula and modules (see Activity 2.5.)

Link to the mean of verification: MoV 2.2.

Activity 2.3. Conduct Participatory Rural Appraisals with communities to develop conservation agreements and identify challenges, needs and opportunities

Considering our in depth engagement with the community and our understanding of the village situation, we decided that full Participatory Rural Appraisals (PRA) were not necessary. Instead, we held FGDs in each of the five pilot villages to initiate Rapid Rural Appraisals (RRA).

We have secured five conservation agreements with communities in each pilot village on a voluntary basis. The conservation agreement demonstrates the community's commitment to:

1. Support and actively applied GAP in their farming practices;
2. Proactively conduct any activities to prevent environmental disaster, such as forest fire, flood, landslide, through the implementation of ecosystem restoration and land rehabilitation;
3. Reduce any destructive activities such as encroachment and illegal logging, illegal animal hunting and trading, and reduce the utilisation of agro-chemical substances;
4. Actively participate in any capacity building activities/training;
5. Actively establish collaboration with multi-stakeholders include farmer groups, village and district government, FMU II Bolsel-Boltim, BNWNP Authority, BKSDA North Sulawesi, Palm Research Agency, BSIP, Protected Area and Watershed Management Agency, Manado State Polytechnic (Polimdo), CSOs (WCS, etc), and private sector (PT. Cargill).

Communities are found to be increasingly less resistant to the regional regulation designating the Binerean Corridor as a wildlife refuge. Key to this has been the active support for agricultural activities alongside the commitments in support of wildlife, including through more environmentally friendly agricultural practices (agroforestry, intercropping, etc.). Farmers

understand they will receive assistance in the form of training and access to seeds/seedlings. These changes in perception towards the regulation can be noted through the community's willingness to map their land in the Binerean and Matayangan Corridors. Through this, they can also provide information on their land condition and the assistance and seedlings that they need. They are more supportive of conservation efforts for maleo and other species as a result, especially for yaki (black-crested macaque), who are still considered as a pest but with communities more engaged and interested in conflict mitigation efforts.

Link to the mean of verification: MoV 2.3.

Activity 2.4. Assess landscape agricultural, value chain and alternative livelihood opportunities

An assessment was conducted in April 2022 led by Polimdo (Manado State Polytechnic), using a purposive sampling method. Interviews were conducted with Village Heads, farmer representatives, collectors, government officials, including from Bapelitbangda Bolsel and the Bolsel Agricultural Agency. A further assessment was conducted by BSIP in 2023.

The assessment revealed that in general, farmers own 1-2 ha of farmland, planting coconut in addition to other crops and trees (such as candlenut, clove, cocoa, durian, for example). The soil in our project site is rich in phosphorus but poor in nitrogen and organic carbon, which requires the application of organic fertiliser. BSIP also identified that the coconut productivity in our pilot villages is good and looking at the characteristics of the nut, it has the potential to be the source of coconut seedlings.

Farmers usually sell coconuts to collectors who directly harvest coconuts from the farmers' farm. These collectors then sell on to larger collectors in Molibagu, Bolaang Mongondow and Amurang, many of whom have cooperation agreements with PT Cargill (see Figure 9). Village collectors can transport coconut directly to the company upon recommendation from the larger collectors.

The re-evaluation carried out in the villages of Mataindo, Mataindo Utara, Torosik, and Adow confirmed our findings that copra is the primary product obtained. The farmgate price of coconuts ranges from IDR 1,200-3,000/nut (GBP 0.06-0.15/nut), while the price of copra ranges from IDR 4,000 - 5,000/kg (~GBP 0.20-0.25). Collectors sell the copra to the company at a price of IDR 10,800/kg (~GBP 0.54/kg).

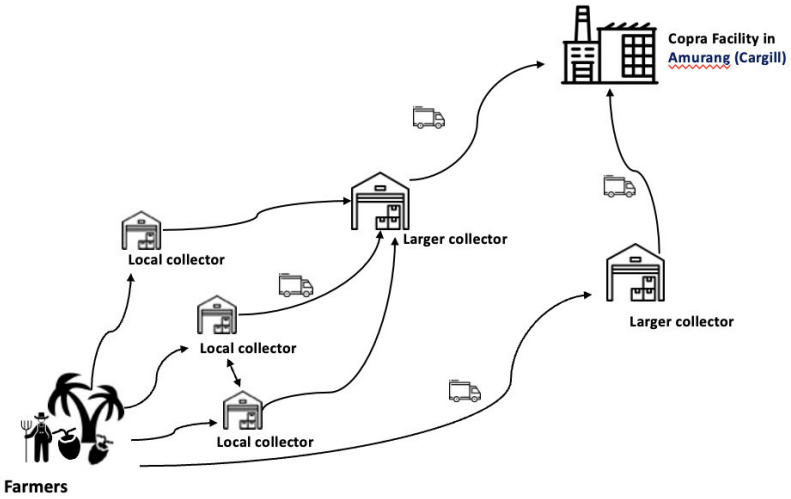


Figure 9. Coconut and copra supply chain in the project site.

A hectare of land can produce 2 tons of copra/year, on average. It is therefore estimated that a farmer can earn a net profit of IDR 9,000,000/ha/year (~USD 614/ha/year; GBP 448.23) from copra production. The BSIP assessment revealed that value addition from processing copra stands at Rp 1,748.59/kg, resulting in a value added ratio of 46.64% (<50% and therefore representing relatively low added value). To ensure a positive impact on coconut farmers, the minimum price for copra should range from Rp 6,500/kg (with a value added ratio of 50.57%) to Rp 7,000/kg (with a value added ratio of 54.27%).

Therefore, it is imperative to improve the efficiency of the supply and introduce additional processing within the value chain at the community level, provide training for farmers to produce derivative or higher value products from coconut, improve access to finance (to support investment in value-addition), and support farmers to develop other additional sources of income. The assessment also revealed that coconut derivative products have enormous potential due to the market and relatively steady prices. These include virgin coconut oil (VCO), coconut flour, coconut milk, biodiesel, coco fibre, activated carbon, charcoal briquettes and others.

Some communities in Adow and Matayangan Villages are already producing coconut oil to add value to their products and in the hopes of improving their incomes, however they have confronted various difficulties in processing techniques, resulting in a non-durable product. Further challenges are linked to marketing products and ensuring sufficient market access.

We have also supported farmer groups to identify potential additional sources of income from nutmeg, candlenut, clove, passion fruits, and butterfly pea. Nutmeg provides a good opportunity for securing an additional income, as the price of nutmeg and particularly mace is relatively high. We trained 97 farmers (90 females and 7 males) in two villages on the potential for value addition for coconut, producing nutmeg juice and dodol (a snack with soft texture and sweet taste), passion fruit syrup, and butterfly pea tea. However, the market for these derivative products has not developed well. Beyond this project, we will continue to provide support for these farmers particularly in value addition and processing and explore the potential to facilitate discussions with market players about responsible sourcing from the landscape.

Link to the mean of verification: MoV 2.4.

Activity 2.5. Design and deliver a farmer training programme on GAP, institutional strengthening, support for rehabilitation, agroforestry or intercropping

Following the result of the farmer needs assessment and the discussions with relevant stakeholders in October 2022, we developed a 'GAP+' training curricula (agriculture plus conservation), including seven modules and associated training materials:

1. Introduction to the village and forest area:
   Covering the function of state forest and other purpose areas, the up- and down-stream area concept, watershed and water catchment areas, information on the ecosystem essential area and wildlife corridor, and high conservation value areas.
2. Good Agricultural Practices for Coconut:
   Covering climate and land suitability, good quality seedlings, nursery development, land preparation, coconut planting and maintenance, pest and disease control.
3. Agroforestry:
   Covering the agroforestry concept and associated practices, forest ecosystem restoration, sustainable forest management, social forestry, and agricultural practices in steep slope areas using a terrace system.
4. Organic agriculture:
   Covering nursery and seedling development, coconut planting and maintenance, and the production and application of organic fertiliser.
5. Living in harmony with wildlife:
   Covering an introduction to conservation areas in Sulawesi, understand the wildlife species, mitigation of human-wildlife conflict.
6. Business Management:
   Covering input-output processes in farming, recording and bookkeeping, understanding the market of agricultural products, and the opportunity to access finance for environmentally friendly agriculture.
7. Alternative Livelihoods:
   Covering the identification of various high economic value agricultural commodities in the village and their derivative products, introduction to the permit for household scale food industry and food and drug control agency certification.

In total we have engaged 917 farmers initially and intensively trained 592 farmers. We collaborated with BSIP in delivering the training to the farmers. In several training sessions, the staff of BNWNP, FMU Unit II and BKSDA Sulawesi Utara participated in the training. To improve the effectiveness of our support to the farmers, we selected 25 key farmers, who received intensive training from the WCS team in collaboration with BSIP on GAP of coconut and agribusiness. These key farmers now act as agents of change within the community by providing assistance and sharing their knowledge and experience with their fellow farmers.

Results of the GAP training:

- Around 10% of farmers have adopted GAP practices, in particular the use of liquid organic fertiliser (POC), which is being used for coconut as well as on seasonal plants (chilli) and annual plants (such as clove and nutmeg).
- We have developed demonstration plots to assess the impact of POC application on yields. This showed that the application of POC can improve yields by around 60% (average of 31.75 fruit bunches per tree which initially only 19.87 in a six-week period).
- Farmers have also benefited from receiving assistance with access to seedlings (both multi-purpose tree species; MPTS and coconuts). In collaboration with BSIP and the Watershed Management and Protected Forest Agency of Tondano (BPDASHL) in Kima, Manado, we have distributed 2,000 good quality coconut seedlings and 7,000 MPTS seedlings of multi purpose tree species to farmers (see activity 3.2).
- Farmers also increasingly understand that the GAP assistance developed and offered through the project by WCS is related to the Regional Regulation designating the Binerean Corridor as a Wildlife Refuge, meaning there has been an increased understanding of, and support for, improved land management, and increased support for wildlife conservation

efforts (e.g., for maleo). There is however a need to continue support for mitigating conflict with yaki, who are still considered as a pest.

Link to the mean of verification: MoV 2.5.

Activity 2.6. Conduct a feasibility assessment for value addition in the coconut supply chain and other potential additional sources of income, and develop draft business plan

As explained in activity 2.4, the potential additional value associated with processing coconut into copra is relatively low. We have therefore scoped opportunities for further value addition and securing additional incomes, including:

- From coconut: potential to produce virgin coconut oil (VCO), nata de coco and hydro coco, organic fertiliser, cocopeat, etc.
- Producing nutmeg derivative products such as nutmeg juice and dodol, in addition to its seed and mace.
- Candle nut potential to produce candle nut oil
- Clove: potential to produce clove oil
- Durian: potential to produce dodol.
- Arenga: potential to produce arenga sugar.

As explained in activity 2.4, the main challenge in developing these additional sources of income is the lack of market demand for these products and farmer capacity to produce products in sufficient quantities and qualities as required by markets that exist in the other islands in Indonesia. Based on this, it has been considered to be more strategic to focus on improving farmer capacity in producing these products, while facilitating communication with the market player, before developing a business plan that risks raising community expectations prematurely. We do however have indications of the potential additional sources of income possible associated with different options for value additional and derivative products, forming the basis for the business plan development.

Link to the mean of verification: MoV 2.6.

Output 3: A co-management model for protecting biodiversity, forest and ecosystem services is designed and implemented across the landscape

Activity 3.1. Conduct multi-stakeholder meetings to jointly develop and support implementation of co-management plan in high conservation value forests

This project has primarily focused on the 287,100 ha of BNWNP and its southern buffer zone in Bolaang Mongondow Selatan District, comprising part of the FMU Unit II (139,400 ha of production and protected forest) and the gazetted Binerean wildlife corridor. The Binerean wildlife corridor connects the main habitat of maleo in the BNWNP and its nesting ground along the beach that is located outside the state forest area. The landscape's forests are bordered by farming communities.

WCS has supported both the BNWNP authority and FMU Unit II in formulating the management plans for each area, respectively. We have also played an active role in the KEE collaborative forum and facilitated the formulation of the action plan for the Binerean wildlife corridor for the period of 2021-2025. Looking at the strategic location of the Binerean wildlife corridor that connecting BNWNP area, FMU Unit II area and the area for other purpose under local government authority, the development of management action plan has addressed the management plan of BNWNP and FMU Unit II as well as long and mid-term development plan of the district and villages in the adjacent area (which also WCS facilitated village under this project).

The management action plan consist of 4 programmes, includes

- Area protection to maintain ecological processes in the landscape to support community livelihood conducted by all stakeholders in line with its respective authority, task and function, and responsibility.
- Preservation of Biodiversity to prevent the extinction of biodiversity, preserve its genetic purity, and maintain ecosystem balance to be utilised in a sustainable way.
- Ecosystem restoration to restore the function, productivity, services, and connectivity of the corridor.
- Sustainable utilisation to ensure the optimum benefit to the surrounding community by taking into account biodiversity conservation and the need of future generations.

During the project, WCS facilitated several multi-stakeholders meetings to disseminate information on best practices and to improve collaboration among stakeholders, including:

- In December 2023, WCS-IP organised a dissemination event in Manado, during which Dr. Johny Tasirin, from the Forestry Program at University of Sam Ratulangi, introduced the Institutional Platform to stakeholders. This platform aims to engage regulators (at the policy-making level), operators (at the management and administration level), and executors (responsible for on-site implementation) in facilitating knowledge exchange regarding the Biodiversity Protection Partnership, environmental services, and ecosystem support for green development initiatives across both Bolaang Mongondow District and North Sulawesi Province.
- In February 2023, WCS-IP supported North Sulawesi Provincial Government and BNWNP Authority to hold a multi-stakeholder meeting to share the lessons learned from the collaborative management of the Tanjung Binerean wildlife corridor. During the meeting, the participants reviewed the structure of the multistakeholder forum to be more effective in supporting the management of the landscape, by taking into account the recent situation, opportunity and challenges facing this landscape. The Forum KEE also finalised its 2023-2024 action plan and roadmap of Binerean Corridor Management.
- The initiation process of drafting the Sustainable Coconut Roadmap resulted from identifying the need for coconut replanting in Binerean, which brought together WCS-IP and BSIP Palma to obtain coconut seedlings. BSIP Palma was highly interested in the 'Coconut for Maleo' concept developed by WCS-IP in Binerean and they were eager to collaborate with WCS. Their first visit to Binerean was conducted together with NAM (BSIP Palma had previously collaborated and had a good relationship with NAM and ICC). The results of the visit resulted in further support for their involvement in Binerean. BSIP-Palma then joined the KEE Forum, which resulted in further discussions about securing funding from NAM, as well as interest in ICC as another supportive party. The Chairman of the KEE Forum (Acting Head of Bapelitbangda) then followed up on the coconut development opportunities in Bolsel and furthered discussions with BSIP Palma, NAM, and ICC. This resulted in the idea of creating the Sustainable Coconut Development Roadmap. Several discussions were held both online and offline between the Bolsel Regional Government team, BSIP Palma, NAM, ICC, and WCS-IP, with the resulting roadmap then formally submitted to NAM to obtain funding.

Link to the mean of verification: MOV 3.1.

Activity 3.2. Train and support community-government ranger teams to patrol BNWNP and FMU and conduct community outreach

We have supported capacity building training on SMART patrols for our key government partners including the BNWNP Authority, BKSDA Sulut and FMU II Bolsel Boltim. On 30th May-2nd June, 2022, WCS facilitated refresher training for SMART data operators in BNWNP. The 3-day training was conducted at section 1 of Limboto - BNWNP, and was attended by 17 participants, including six new SMART data operators. We also facilitated a 3-day training on SMART Patrol data analysis and use to strengthen effective protection strategies. This training aimed to analyse data

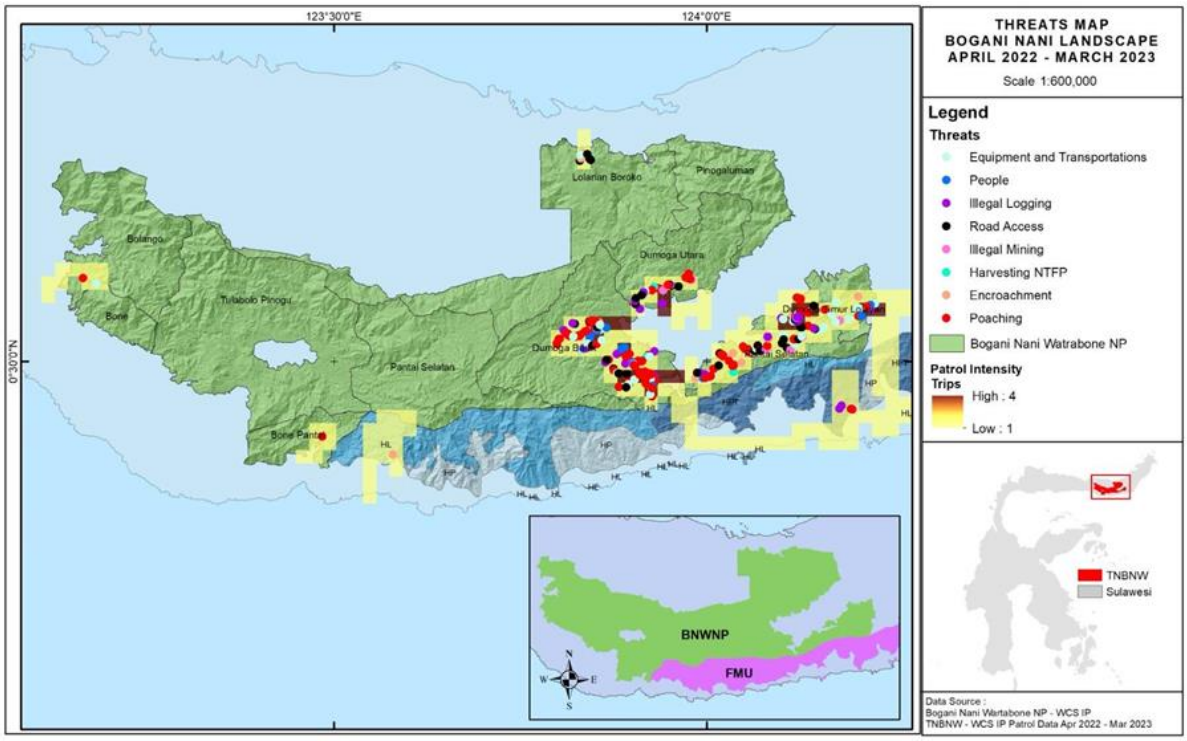
from the SMART patrol efforts that had been carried out and provide updated information on the current condition of the area to inform protection strategies. We held another training on 22-24 September 2022, attended by 22 participants consisting of 14 BNWNP staff and eight WCS staff. Following the training and joint activities implemented so far, BNWNP staff can now carry out SMART patrol activities independently without WCS support. SMART patrols have been included in the park's work and budget plan, which ensures that SMART patrol activities will be funded from the government budget allocation. BNWNP has also now become a 'centre of excellence' for the implementation of SMART Patrols and Resort-Based Management and some of BNWNP staff have become resource persons for other national parks and conservation areas.

On 9-10 February 2023, we conducted SMART patrol mentoring for FMU II SMART Patrol data operators. We also trained five newly assigned staff, who will join the patrol teams, thereby increasing field presence.

Between 2021-2023, WCS and BNWNP team conducted SMART Patrol over 3,128.89 km. Meanwhile WCS and FMU Unit II team conducted SMART Patrol over 444.22 km (Table 5). Figure 10 and Figure 11 demonstrate the patrol intensity and threats encountered from 2022-2023 in BNWNP and FMU II. For example, the teams removed 365 snares traps, 427 bamboo traps and 10 bird traps and recorded 29 illegal encroachment points and 64 illegal logging points in BNWNP in this time.

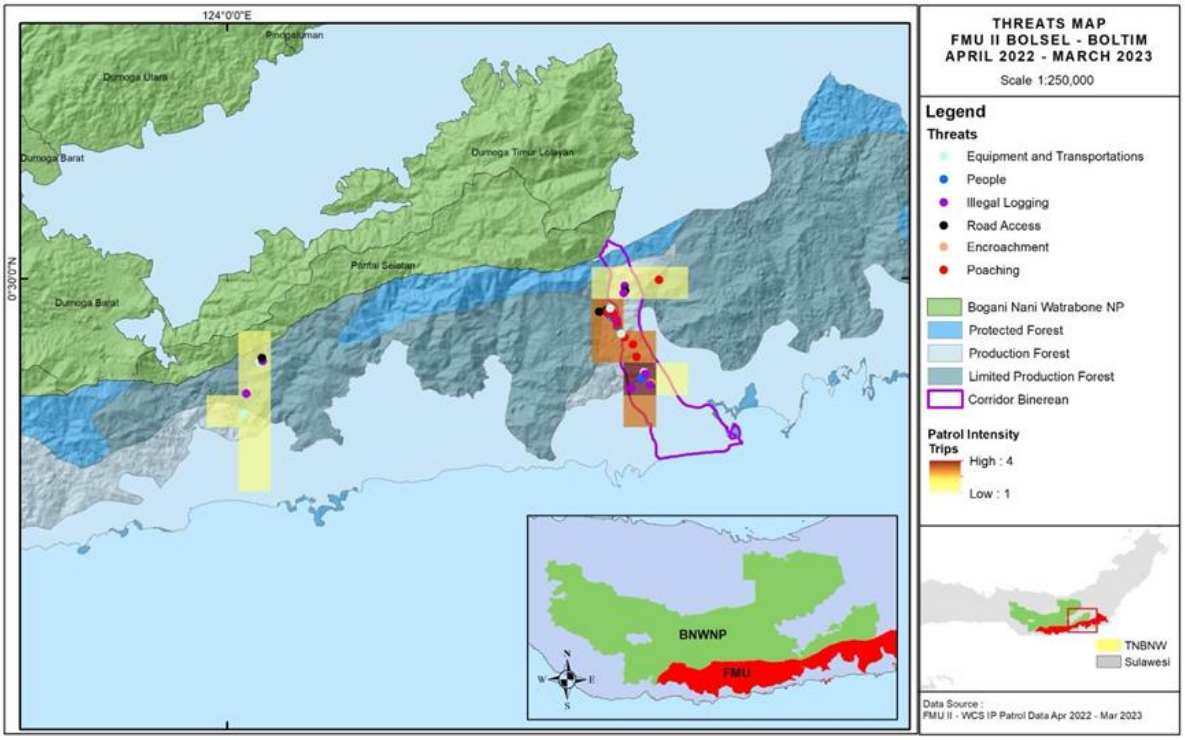
Table 5. SMART Patrol distance in BNWNP and FMU II

	BNWNP	FMU II
Year	Patrol distance (km)	Patrol distance (km)
2021	1,647.16	181.68
2022	751.47	117.76
2023	730.26	144.78
Total	3,128.89	444.22



Source from WCS-IP

Figure 10. Patrol Intensity and Threats Found By Patrol Teams in Bogani Nani Wartabone National Park (April 2022 to March 2023)



Source from WCS-IP

Figure 11. Patrol Intensity and Threats Found by Patrol Teams in Forest Management Unit II of Bolsel-Boltim (April 2022 to March 2023)

Link to the mean of verification: MoV 3.2.

Activity 3.3. Establish restoration, supported by government and with active participation of communities, in degraded watershed forests

Based on the forest and land cover change analysis and from the results of the farmland mapping, we have identified potential areas for restoration in the Binerean Corridor and Matayangan Village. We have mapped around 30 polygons of coconut farmland inside the BNWNP. Together with the BNWNP Authority, we have identified a reference ecosystem as a guideline for us in selecting tree species for the restoration activities. We restored the farmland inside the BNWNP by implementing enrichment planting of durian, candle nut and nutmeg seedlings. In addition to restoring the ecosystem, it is expected that these tree species can produce high economic value commodities as additional sources of income for the communities. Meanwhile, we have also been discussing with FMU II regarding the restoration of degraded watershed forest in collaboration with four forest farmer groups in Mataindo and Mataindo Utara through a social forestry scheme.

The restoration activity was set to begin in December 2024 adjusted to align with the rainy season, however was subsequently delayed due to the limited availability of nutmeg seedling stocks at the BPDAS nursery. Based on requests from Matayangan farmers and the BNWNP ecosystem guidelines, available MPTS seedlings for planting include nutmeg, durian, and candlenut. However, requests for avocado and coconut seedlings could not be accommodated as all mapped farmers' plots are within the BNWNP boundary, which in line with the government regulation only allows native forest tree species to be planted for restoration of degraded areas within national parks.

In the Binerean corridor, there has however been progress in restoring/enriching agricultural land through the introduction of additional trees on farms. Following the completion of land mapping in September 2023 (1,212 plots mapped), the next phase involves providing requested seedlings to farmers. These include MPTS (nutmeg, durian, candlenut, avocado, mango, rambutan, nantu, champaka, etc) from BPDASHL Tondano nurseries and Mapanget coconut seedlings from BSIP Palma. From October to December 2023, three seedling collections yielded approximately 21,137 MPTS and 6,000 Mapanget Coconut seedlings. These were distributed to farmers across four villages: Mataindo (95 farmers), North Mataindo (85 farmers), Torosik (110 farmers), and Adow (46 farmers), totaling 336 recipients. Typically, seedlings are planted within existing garden plots, aiming to enrich land through agroforestry or intercropping methods. Assuming each farmer owns about 1 hectare, ecosystem restoration efforts in the Binerean corridor cover roughly 336 hectares.

Link to the mean of verification: MoV 3.3.

Activity 3.4. Conduct applied conservation and agroforestry research in the landscape

During the project we have established three agroforestry demonstration plots in Binerean, Mopopungu and Matayangan with a total area of 3 ha.

For example, within the demonstration plot in Mopopungu, we planted different tree species intercropped with short-term high economic value plant species such as pineapple, ginger, chilli, nut, and lemongrass. This has included more than 150 seedlings of tree species including ebony, champaka, palaquium, nutmeg and fruit trees (avocado, mango, rambutan, durian and matoa), and arenga sugar. We have also held GAP+ training for the facilitated farmers in this demonstration plot.

We divided the demonstration plot into two experimental sections: one with the GAP application and another one as control without the GAP application. The experimental section with the application of GAP techniques demonstrated better results, particularly after the application of

liquid organic fertiliser (POC). Research demonstrated a 60% increase in yields associated with the application of POC.

In October-December 2023, through the Research Fellowship Programme (RFP) and 'Kampus Merdeka' (Independent Campus) Programme, six university students were selected to conduct research in the Binerean Corridor, as their proposals fit well with the research roadmap for this landscape. This included one student from Tanjung Pura Univeristy in Pontianak, West Kalimantan Province, and four students from the University of Sam Ratulangi Manado.

One student conducted a sedimentation analysis to assess the impacts of agroforestry in the Binerean Corridor. The research aims to compare the rate of sedimentation in agricultural areas that use agroforestry planting patterns and the rate in agricultural areas under conventional farming methods and without agroforestry in the Binerean corridor. The acquired data is also expected to explain how land management impacts sedimentation levels and aims to assess the effectiveness of agroforestry planting patterns in reducing sedimentation rates. The results will support the community to optimise their land use by considering soil quality, sedimentation rates and sustainability of land use.

The other 5 students conducted research on the following topics and currently still finalising their thesis:

1. Land and forest management strategy, sustainable non-timber forest product and agroforestry approaches
2. Human wildlife-conflict and habitat conservation strategies
3. Gastropods
4. Maleo behaviour
5. Bat behaviour

Link to the mean of verification: MoV 3.4.

Activity 3.5. Hold government-led stakeholder consultation workshops to compile and then disseminate project results and lessons learned to village, district, provincial and national level partners

In support of MoEF and the designated World Maleo Day (21 November 2022) and to raise public awareness on the importance of maleo conservation, we held a two day international symposium in Kotamobagu on 21-22 November 2022 together with the Bolsel District Government, BKSDA Suluti, and the BNWNP Authority. This included a full day workshop with speakers from Bolsel District Government, CSOs (Aliansi Tompotika, Biodiversitas Gorontalo), and the National Innovation and Research Agency (BRIN). This provided the opportunity to highlight the progress of the project in supporting farmers in the five pilot villages producing wildlife-friendly coconut that support the protection of maleo. The second day involved a Village Expo including competitions (children colouring competition, mimicking maleo's voice and behaviour, social media reels) and art performances.

In March 2023, WCS supported Bolsel District Government and BNWNP to submit a proposal, update project progress and lessons learned to NAM CSSTC. This proposal aims to identify available coconut resources in Tanjung Binerean, develop a sustainable coconut processing industry that can meet international market demand, and increase the income of coconut farmers in the surrounding area of Tanjung Binerean. In the meeting with NAM CSSTC, the Bolsel District Government discussed an opportunity for collaboration training on techniques of tissue culture for coconut plants, aquaculture, international certificate training for coconut development, vegetable oil and training for women and youth entrepreneurship. NAM CSSTC has approved the proposal, however the District Government has not taken further action, due to the person in charge for the proposal has been assigned to another position within the district government.

In September 2023, a community outreach initiative took place, involving participation in the World Coconut Day (WCD) event organised by ICC and the Gorontalo District Government. WCS facilitated the event and joined as a speaker at the coconut symposium, also holding a booth at the exhibition during the WCD event. This provided an opportunity to share lessons on multi-stakeholder collaboration and strategies that support both production and protection to a wide audience.

On November 21-23, 2023, a stakeholder consultation workshop was held at Hotel Sutan Raja, Kotamobagu. This workshop focused on preparing data and information collection for value chain studies, business models, project impact evaluations, and biodiversity assessments to support collaborative management of the Tanjung Binerean wildlife corridor and the Bogani Nani Wartabone landscape. Subsequently, on December 20-22, 2023, a stakeholder workshop was conducted at Swissbell Hotel, Manado. This involved disseminating the results of the value chain studies, business models, project impact evaluations, and biodiversity assessments to support collaborative management of the Tanjung Binerean wildlife corridor and wider landscape. Both workshops were conducted for:

1. Disseminating information and obtaining feedback regarding the results of value chain studies, business model development, project impact evaluations, and biodiversity research (each conducted collaboratively by relevant parties);
2. Reviewing various learnings and making adjustments and developments to the programme related to collaborative management strategies for the Binerean and Matayangan Corridor;
3. Strengthening coordination and synergy among stakeholders in the development of sustainable coconut and Green Development, especially at the provincial level of North Sulawesi.

The attendees are representatives of village officials and farmers from the 5 pilot villages, the Sub-district Head of Pinolosian Tengah, officials from the Regional Government of Bolsel District, representatives from the Provincial Government of North Sulawesi, BKSDA Sulut, BNWNP Authority, FMU II Bolsel, BSIP Palma, faculty representatives from the Forestry Study Program of Sam Ratulangi University (Unsrat), and ICC.

The learning process of private and public sector collaboration in jointly managing the Bogani Nani Wartabone landscape was also conducted through a symposium held during the next World Coconut Day celebration in Gorontalo from September 21-25, 2023. One of the WCS Programme Managers (of the Sustainable Landscapes Programme) was invited to attend as one of the speakers at the symposium and presented on "Coconut and Conservation: Balancing Good Agricultural Practices with Wildlife Conservation for Sustainable Livelihoods." From this presentation, several recommendations were made, including on: i) Government policies to promote sustainable coconut farming, ii) Legal measures to protect maleo and yaki (*Macaca nigra*) habitats, iii) Incentives for farmers to adopt environmentally and wildlife-friendly agricultural practices. This symposium was part of the World Coconut Day event organized by the Gorontalo District Government, Ministry of Agriculture, in collaboration with ICC. WCS-IP was also one of the institutions supporting the implementation of the WCD event.

Link to the mean of verification: MoV 3.5.

Outcome

A replicable, integrated forest management strategy is implemented through collaborative partnerships, demonstrating increased agricultural yields, income and wellbeing for >500 farmers, whilst securing high conservation value forests and critical watersheds.

We have established a strong basis for developing a replicable integrated forest management strategy, supported by a multi-stakeholder partnership, that will increase farmer agricultural yields, income and wellbeing, whilst simultaneously reducing threats to high conservation value forests and critical watersheds. This will be done through strengthening existing multi-stakeholders forum, Forum KEE, collaboration with relevant stakeholders, and provision of

technical assistance to support farmers to improve the productivity and profitability of their agriculture activities.

1.1. By Yr3, one landscape production-protection model is developed and underpinned by a 'zero deforestation commitment' that is signed and enacted through a government, private, community and NGO partnership (baseline 0)

The KEE collaborative forum brought together all relevant stakeholders with a joint vision to support the conservation of maleo and its habitat, and to develop strategies to protect and sustainably manage the Tanjung Binerean Wildlife Corridor. The KEE Forum has developed an management action plan that focuses on 4 major programmes, including:

1. Area protection
2. Wildlife Preservation
3. Ecosystem Restoration
4. Sustainable Utilisation

The management action plan has reflected the commitment of these stakeholders for the production-protection model. The management action plan has been incorporated into the development plan of Bolaang Mongondow Selatan District.

We also supported the District Government in the formulation of Roadmap of Sustainable Coconut Industry and Wildlife Conservation Advancement, with clear division of responsibilities among the key stakeholders in the landscape. The roadmap demonstrated stakeholders' commitment to create a sustainable-coconut sector that, at the same time, contributes to the conservation of key wildlife in the landscape.

Link to mean of verification: MoV 3.1.

1.2. By Yr3, rate of forest clearance in the target landscape is reduced by >20% compared to project baseline (to be determined in Yr1) and the border of BNWNP is secured

The deforestation baseline for 2015-2020 was:

- 10,508 hectares of forest loss with an annual deforestation rate of 0.33% across the landscape;
- 1,566 hectares of forest loss with an annual deforestation rate of 0.11% in BNWNP.

This decreased to:

- An annual deforestation rate of 0.25% across the landscape (2021) (a reduction of >24%), and
- An annual deforestation rate of 0.07% in BNWNP (a reduction of >36% if compared to deforestation rate of 0.11% in 2015-2020)
- Unfortunately, we do not yet have the Year 3 data as we have been working to empower the National Park staff to conduct the remote sensing analysis independently. This is vital for the sustainability of the project and the continued adaptive management of the area by the government. However, due to weather conditions in 2022, we could not obtain a fully clear image for the entire area. They have conducted an initial analysis to identify indications of deforestation (including linked to agriculture and mining) but have not yet finalised their quantitative analysis. This is a priority for WCS following the end of the project.

Link to the mean of verification: MoV 1.2.

1.3. By Yr3, populations trends of at least two of four endangered and national priority species (lowland anoa, babirusa, black-crested macaque, maleo) have increased by >10% compared to project baseline (to be determined in Yr1)

Based on our biodiversity monitoring survey, we found the following:

- 84% increase in the population of maleo (breeding pairs) from 13 pairs in 2021 to 24 pairs in 2023.
- >32% increase in the occupancy rate of anoa; 0,53 (95% confidence interval 0.34-0.73; standard error 0.09) in 2021 to 0.70 (95% confidence interval 0.58-0.78, and standard error 0.10) in 2023.
- >21% increase in the occupancy rate of babirusa; 0.61 (95% confidence interval 0.43-0.71; standard error 0.08) in 2021 to 0.74 (95% confidence interval 0.61-0.78, and standard error 0.10) in 2023.
- In 2023, we assessed bird species richness across different land uses and found 66 bird species, with the highest species richness in forest habitat (48 species), agricultural land (30 species), shrubs (15 species) and wetlands (11 species).

Link to the mean of verification: MoV 1.3.

1.4. By Yr3, >500 farmer households in target communities have increased indices for wellbeing (at least 50% women), including a 10% increase in income and identified opportunities for income diversification, compared to baseline data collected at the start of the project when selecting project beneficiaries

In general, there are three dimensions of wellbeing include material, relational and subjective wellbeing.[3] We assessed the following indicators to measure farmer's material wellbeing:

1. Households assets ownership:

   Our assessment revealed that assets that contribute to the community's wellbeing score are refrigerators, televisions, parabola antenna, wood and cement walls, and access to electricity. On average, the community in Adow and Torosik village have wellbeing score below zero,while the community in Deaga, Mataindo, Mataindo Utara have wellbeing score above zero.

2. Household income

   As explained in activity 1.4, in general, farmer incomes have increased, although the increase in a few villages is not significant (at <10% in Adow and Mataindo Utara Village), while in others there have been significant increases of >100% (Mataindo and Torosik). Further to this, we have demonstrated the potential for significant yield increases associated with the application of GAP and the use of POC, in particular, with the potential to support income improvements with further community adoption.

   Through our training program, farmers have identified potential additional sources of income from producing derivative products from nutmeg, candlenut, butterfly pea, durian, and arenga sugar. However, lack of market demand for these products is a challenge for further development.

[3] Woodhouse, E., de Lange, E., & Milner-Gulland, E. J. (2016). *Evaluating the impacts of conservation interventions on human well-being: Guidance for practitioners*. IIED. http://pubs.iied.org/14667IIED

3. Household expenditure

As explained in activity 1.4, although on average the household income increased, the assessment found that average household expenditure increased in parallel (except for Torosik village, where the average household expenditure exceeds income).

Although the material wellbeing is not increased significantly there are other aspect of community wellbeing that in our observation increased within the community which include:

- Social relations strengthened.

  As explained in activity 2.5, initially farmers established farmer groups merely to be able to access government assistance. Our technical assistance for farmers is targeted to the farmer group, thereby strengthening farmer organisational capacity and improving information sharing among the members. The training also enhanced networking opportunities for farmers, which can facilitate access to services from the public and private sector, as well as provide the basis for opportunities that can support access to markets in the future.

- Increased farmer capacity.

  Provision of training to the farmers results in positive improvement in their knowledge and skills including their agronomic practices, bookkeeping, development of additional sources of income (particularly among women groups).

  The provision of training and our wider engagement with farmers led to encouraging local leadership within farmer groups, as demonstrated by the key farmers selected by the community.

- Freedom of choice and action

  Following free, prior informed consent activities at the beginning of the project, we provided the opportunity for farmers to provide their consent and also to voluntarily decide whether they will join the training program or not. The community is also free to decide to enter into a conservation agreement or not.

  In this project we facilitate the multistakeholder discussion, where each stakeholder including community representative can raise their opinion and concern, as well as be involved in the decision making process in regards to the sustainable management of natural resources in their village and across the wider landscape.

1.5. By Yr3, >GBP150,000 in private sector financing leveraged for project continuation over the medium-term (baseline = 0)

PT. Cargill provided initial co-funding for the project. PT. Cargill is one of two agricultural supply chain large companies operating in the landscape and the main buyer of copra from the landscape. We are in discussion with PT. Cargill on the possibility to continue their funding support for landscape activities, including the provision of technical assistance to farmers in the landscape that are within their supply chain. This has been explored through a joint field visit in November 2023, where they indicated a willingness to continue. They have also reiterated this through discussions with Bolsel District Government, where they committed to support farming communities in the landscape through their CSR Program.

For Cargill and WCS, it is important to ensure we have aligned objectives before continuing, including related to:

- Sourcing opportunities and whether the volumes are sufficient to warrant Cargill investment in traceability.

- Opportunities and prices for farmers with respect to copra versus other value-added products for coconut.

We have initiated discussion with the Cargill team, including the team in Asia-Pacific responsible for sustainable sourcing in the coconut sector as well as with global leads for coconut and forests.

Another private sector operating in landscape is PT. JRBM (J Resources Bolaang Mongondow), a gold mining company. The WCS team did not engage this company, however, the Bolsel District Government had invited the company to participate in the Forum KEE, although the company has not responded positively to the invitation. Through its CSR program, the company supported communities in Adow and Torosik village to conduct rehabilitation of degraded land.

3.2 Monitoring of assumptions

Outcome-level assumptions:

The outcome level assumptions held true and were continuously assessed throughout the project. These include the following:

Assumption 1. Stakeholders recognise the need for, and benefits of, a new approach to improve forest management and farmer livelihoods.

The KEE collaborative forum and one-to-one engagement with stakeholders provided means to assess stakeholder perceptions and interests with respect to the need for, and benefits of, a new approach to improving forest management and farmer livelihoods. The stakeholders demonstrated recognition of the interconnection between forest and wildlife conservation and agricultural activities, particularly recognising the benefits of the ecosystem services provided by the forest. Through discussions within the KEE collaborative forum, stakeholders recognised the value and the key role of forest and wildlife to the green growth plan and maintaining/improving agricultural productivity. Conversely, forest management authorities (e.g., BNWNP Authority, BKSDA Sulut, FMU II) demonstrated their recognition of the need to engage communities and enhance farmer livelihoods in order to meet conservation objectives.

Assumption 2. Improvements in yields and opportunities for income diversification through other commodities do not coincide with commodity price decreases.

This continues to be an important assumption for ensuring that improvements in yield and quality lead to opportunities for improved incomes. The price of agricultural commodities fluctuates, depending on the market, and therefore - with reductions in prices - has the potential to affect the outcome of the project. In recognition of this, the project identified the importance of income diversification and value addition.

Assumption 3. The project is able to overcome COVID-19 impacts on travel, meetings, training and surveys through designing and implementing a series of practical safety measures that are regularly reviewed and modified as needed.

This assumption held true. In Year 1, the COVID-19 pandemic limited our ability to deliver the project, especially due to limits on travel, and in-person meetings, training and surveys that required direct engagement with stakeholders. Following Year 1, the Government eased restrictions related to the COVID-19 pandemic. Despite this, there continued to be COVID-19 cases in Indonesia, although relatively few, throughout the project, therefore we continued to apply health and safety measures throughout project implementation.

Output-level assumption:

Output 1 assumptions:

- Satellite imagery is available, accurate and cost-effective to access: Satellite imagery was available and cost-effective to access, enabling our team to analyse forest and land cover changes in the project area. One additional assumption identified, which impacted the analysis of forest and land cover changes in Year 3, was that satellite imagery would be free of cloud cover and therefore support the analysis of the whole project area. Due to weather conditions in 2022, we were unable to obtain clear images for the entire area. The team therefore instead had to conduct an initial analysis to identify indications of deforestation, where feasible.
- Communities trust field teams and so provide accurate information on socio-economic conditions and needs: This assumption held true. Our team spent significant time in the villages and were able to build community trust. We established and maintained good relationships with the community and were able to maintain community trust. This has been supported by increased community understanding of WCS and the project's objectives in supporting livelihoods and agricultural activities in addition to wildlife conservation, which in turn has built increased support for the latter.

Output 2 assumptions:

- Stakeholders recognise the risk of commodity production associated with deforestation to the future of agricultural sectors and community livelihoods.
- Communities recognise the value of forest protection and restoration and trust that benefits from improved agricultural practices will improve their livelihoods.
- Farmers adopt practices from training in their own farms.

These assumptions hold true. There is increased understanding by stakeholders of the risk of commodity production associated with deforestation, which has motivated them to support farmers to transition to produce biodiversity-friendly commodities. Communities will only recognise the value of forest protection and restoration and adopt GAP and produce biodiversity-friendly commodities if they believe that these practices will ultimately improve the productivity and profitability of their farming activities.

Output 3 assumptions:

- Decision-makers consider science-based evidence in landscape management.
- Key stakeholders recognise the need to develop an integrated science-based management plan as the landscape consists of different land use types and functions that fall under different management authorities. From this, the co-management model is jointly developed by the relevant stakeholders, who are fully informed of the plan, their respective roles within it, and fully support its implementation.
- These stakeholders are also willing and able to adapt the intervention strategy based on the applied research findings that emerge over the project years.

Stakeholders recognised the interconnectedness of forest and wildlife conservation and community livelihoods/agricultural activities. They therefore recognised the need for an integrated approach and were receptive to the results of socio-economic assessments, biodiversity surveys, forest and land cover change analysis, and SMART Patrol findings to inform the development of landscape management strategies. Decision makers therefore understood the importance of science-based evidence in landscape management and started to integrate this into the decision making process, as demonstrated by the development of the KEE management action plan and the development of the Roadmap of Sustainable Coconut Industry and Wildlife Conservation Advancement of the Sustainable Coconut Roadmap.

3.3 Impact: achievement of positive impact on biodiversity and poverty reduction

The impact of this project in the original application was that biodiversity and forests in the landscape are well protected and restored by empowered community and government partners, and communities have viable livelihoods from the production of deforestation-free agricultural commodities.

In this project we are working closely with the BNWNP Authority (the management authority of the BNWNP), FMU II Bolsel Authority (the management authority of the FMU area), relevant agencies within Provincial and District Government, and the KEE collaborative forum - a multistakeholder governance structure that oversees the management of ecosystem essential areas and brings together the above stakeholders. With increased understanding of the importance of biodiversity and forest conservation, the stakeholders in the landscape including communities are actively involved in conservation activities as described in the ecosystem essential action plan. With the development of an integrated monitoring system for the National Park, authorities empowered to conduct independent SMART patrols, and with communities increasingly supportive of forest and wildlife conservation, there is the basis for the long-term protection of forests and biodiversity. Furthermore, deforestation rates have been found to be decreasing and the populations of key species found to be increasing, demonstrating positive trends for forests and wildlife.

We have supported communities in five pilot villages to produce biodiversity-friendly commodities, through the provision of GAP training to improve the productivity and profitability of their farming activities, strengthening farmer institutions, and developing additional sources of income (see explanation in outcome 1.4. for how the project improved community wellbeing). Pathways are therefore in place to support communities to have viable livelihoods from the production of deforestation-free agricultural commodities, although it is recognised that additional support and enabling conditions (e.g., linked to seedling and market access) are needed to ensure that these are fully realised over the long term.

Through these interventions and results, the project is making positive progress towards the expected impact.

4 Contribution to Darwin Initiative Programme Objectives

4.1 Project support to the Conventions or Treaties (e.g. CBD, Nagoya Protocol, ITPGRFA, CITES, Ramsar, CMS, UNFCCC)

The project has contributed towards meeting the Convention on Biological Diversity (CBD) objectives outlined in general measures for conservation and general use, sustainable use of components of biological diversity, and incentive measures. Activities under this project are particularly relevant to the agricultural biodiversity and forest biodiversity programme of work.

More specifically in Indonesia, this project has supported the Government of Indonesia (GoI) to meet its National Targets (NTs) under the CBD, with a particular focus on achieving progress towards, among others, NT7: Improved sustainably managed land for agriculture; NT11: Realisation of sustainable maintenance and improvement of conservation areas, including sustainable management of protected forest; NT12: realisation of efforts to maintain the populations of endangered species as a national conservation priority; and NT14: Improved functionality of integrated ecosystems to ensure the improvement of essential services (water, health, livelihoods, and tourism).

Training and support for farmers to improve land productivity under Output 2 is in line with GoI's efforts to achieve NT7- improved sustainably managed land for agriculture, as outlined in the IBSAP (Indonesia Biodiversity Strategy and Action Plan) document. The development of a KEE management action plan and forest patrol activities, and the initiation of forest restoration under Output 3 has directly contributed to the protection of high biodiversity value forest in the landscape and improved management of the first Ecosystem Essential area in North Sulawesi, as well as training for farmers (Output 2), has supported progress towards achieving NT11 and NT14. These activities, along with the positive trends assessed for the populations of priority endangered species, including the maleo (*Macrocephalon maleo*), babirusa (*Babyrousa celebensis*), and the lowland anoa (*Bubalus depressicornis*) has supported the GoI's protection of priority species and progress towards NT12.

With the introduction of agroforestry systems on farms and the demonstration of agroforestry models in reducing sedimentation/run off, the project is also supporting GoI's target to restore ecosystems outside conservation areas through watershed forest rehabilitation proposed and contributed towards progress to meet NT15 (Implementation of conservation and restoration of degraded ecosystems in the region).

WCS operates in Indonesia under an MoU with the Ministry of Environment and Forestry (MoEF), signed by the Director General (DG) of Natural Resources and Ecosystem Conservation (KSDAE), and liaises regularly with the DG on all WCS activities in Indonesia. The DG is the CBD focal point for Indonesia. The BNWNP authority and BKSDA Sulut, which is responsible for managing conservation areas and wildlife outside the National Park, are the technical implementation unit under the DG KSDAE. We have submitted quarterly reports and hold regular meetings with them to update all WCS activities in this landscape, including this project. We also have submitted annual reports to the DG of KSDAE on all WCS activities in Indonesia.

4.2 Project support to poverty reduction

The beneficiaries of this project are more than 500 coconut smallholders farmers in the five pilot villages in Bolsel District, North Sulawesi Province. The majority of farmers owned 1-2 ha of land. The farmers confronted various challenges including low productivity of coconut due to lack of knowledge about Good Agricultural Practices (GAP). Baseline productivity of coconut is at around 2 ton/ha/year, with the potential to increase this with the application of GAP to around 3.5-4 ton/ha/year. Due to a lack of coconut processing facilities and market access, farmers only sell coconut and copra with very low profit and in some cases the farmers suffer losses.

This project has equipped farmers with the knowledge and skills to produce more environmentally friendly commodities by providing GAP+ training to improve the productivity and

profitability of farming, strengthen farmer institutions, develop additional sources of income and increase support for conservation.

This project has facilitated farming communities to engage with stakeholders in the landscape, such as relevant government agencies and the private sector. The representatives of communities from the five pilot villages are members of the KEE collaborative forum, enabling them to communicate their concerns and interests and participate in the decision-making related to the management of natural resources and wildlife conservation in the landscape (see Outcome 1.4. for how the project has supported improved community wellbeing).

4.3 Gender equality and social inclusion

We conducted a Participatory Narrative Inquiry (PNI) training in October-December in 2023 for 35 WCS staff (21 men; 14 women) across programs/units, including field staff from various landscapes to support programmes to address Gender Equality and Social Inclusion (GESI). The training focused on the PNI approach as one of the means to build understanding among staff of gender issues, assess the current status of gender issues in WCS, and provide information to create GESI strategies. To complement the PNI training, we held a national-level sharing session on the theme "Women in Conservation" in December 2023. The event sought to explore the roles and engagement of women within local communities in conservation practices. It was attended by 10 female community members and 8 WCS field staff (5 men; 3 women) from across WCS landscapes and seascapes, including a farmer who is also a female local leader, the secretary of Family Welfare and Empowerment Organization (Pemberdayaan Kesejahteraan Keluarga/PKK) from Mataindo village in the Binerean Corridor, North Sulawesi. The interactive session facilitated meaningful exchanges, enabled women to actively share experiences and practices, and learn the significance of their contributions to conservation through dynamic activities like the web of life and theatrical role plays. This two-day session provided valuable insights for WCS regarding the current status of women's roles and participation in on-the-ground conservation practices.

The socio-economic survey revealed that the proportion of women that completed their nine years of basic education (60%) is higher than men (46%). However women's participation in the management of natural resources (23.78%) is lower than men's (36.92%), which is related to the division of work between women and men, as women tend to take more responsibility for household chores. Therefore our work to support the development of additional sources of income was targeted to women's groups, with this training being delivered to 90 women and 7 men. In our facilitated villages, women's participation in meetings was quite high and during these meetings, they were found to proactively communicate their ideas, interests, and concerns.

One example is Parida, who is considered as a local leader in Mataindo Village due to her various initiatives and active participation in events (such as religious study groups). She joined training on GAP and ecotourism. Following this, she developed her home as a homestay to support ecotourism development in the Binerean corridor. She also participated in training for the development of additional sources of livelihood such as processing nutmeg juice, jam and dodol.

Looking at her leadership at the village, she was selected to represent the women's groups in the landscape in the national sharing session with the theme "Women in Conservation" in December 2023.

Please quantify the proportion of women on the Project Board[4].	45% of this project board are women which hold key roles include Country Director, project leaders, program managers, sustainable landscape commodity advisor, monitoring and evaluation specialist, HR Manager and staff, finance manager, field staff etc.
Please quantify the proportion of project partners that are led by women, or which have a senior leadership team consisting of at least 50% women[5].	More than 50% of our partner organisations are led by women including the Head of BNWNP, Director of Polimdo, Sustainability Lead at Cargill, the Director of BSIP, the Head of the Research and

[4] A Project Board has overall authority for the project, is accountable for its success or failure, and supports the senior project manager to successfully deliver the project.

[5] Partners that have a formal governance role in the project, and a formal relationship with the project that may involve staff costs and/or budget management responsibilities.

	Development Agency of Bolaang Mongondow Selatan District.

4.4 Transfer of knowledge

The project has sought to transfer knowledge to practitioners and policy makers at different levels and through a variety of means, taking a comprehensive approach to engaging and sharing knowledge with local communities, subnational, national and international platforms to promote living in harmony with wildlife, and fostering collaboration and integrated strategies towards conservation and improved livelihoods. This includes through the approaches listed below.

- **Training and the development of demonstration plots:** At the site level, farmers acquired new knowledge and skills through the provision of GAP+ training. The establishment of agroforestry demonstration plots allowed farmers to visualise and learn through hands-on experience, promoting the adoption of sustainable agricultural practices. Selected key farmers also facilitated further shared learning and experience among farmers to improve farming practices and collectively explore innovative solutions to challenges.
- **Visits at the provincial level and site level:** In collaboration with BSIP, we facilitated an exchange visit to BSIP's research centre in Manado. This included representatives of the BNWNP Authority, BKSDA Sulut, relevant district government agencies, and farmers from our facilitated villages. In this exchange visit, the participants shared their knowledge on the challenges and opportunities to develop a sustainable coconut sector in the landscape, and witnessed and learnt about best practices in coconut farming and development of coconut business.
- **KEE collaborative forum meeting:** The KEE collaborative forum held meetings twice annually. This forum provided a good avenue to communicate the findings, challenges, achievements, and lessons learned from the project. As the members of the KEE collaborative forum are the key decision makers and stakeholders in the management of the landscape, input from the project was able to inform their decision making processes including the formulation of relevant policies, strategies, and conservation action to support biodiversity conservation and sustainable agriculture in the landscape.
- **Regular meetings with MoEF both at the site level and in Jakarta:** In accordance with WCS's MoU with the MoEF, we held regular meetings with the MoEF both in Jakarta and with its technical implementation units in the landscape, in this case BNWNP and BKSDA Sulawesi Utara. These meetings are also one of the best avenues for us to present the findings, challenges, achievements, and lessons learned generated by the project to inform the formulation of conservation strategies both in the landscape and across Indonesia through the formulation of conservation policy.
- **Workshops at the district, province, national and international level:** We also communicated and disseminated the findings, challenges, achievements, and lessons learned from this project through various workshops at the district, provincial, national, and international level.
    - At the district level, we held several workshops to gather stakeholders' input to inform the design of the assessment of value addition of coconut, and to enhance collaboration in the management of the Binerean Wildlife Corridor and Bogani Nani Wartabone landscape.
    - At the provincial level, we held a multi-stakeholder workshop to disseminate the results of our coconut supply chain and value chain assessment and project activities in supporting collaborative efforts to conserve biodiversity in the landscape.
    - We also shared the findings, challenges and lessons learned from this project in international events to celebrate the World Maleo Day in Bolsel District, North Sulawesi on 21 November 2022 and in Bone Bolango District, Gorontalo Province on 21 November 2023, as well as at World Coconut Day in Gorontalo District, Gorontalo Province, 21-25 September 2023.

- **One-to-one engagement/meetings:** From our experience, one-to-one meetings with key decision makers are critical for gaining inputs and insights about the project and ensuring this can translate into real conservation action. This direct interaction also fosters trust and strengthens our relationships with the key decision makers. Our team maintained communication and held a series of regular one-to-one meetings with key decision makers in the landscape (including with the Head of BNWNP, the Head of BKSDA Sulut, the Regent, the Head of the Bolsel Research and Development Agency, and the Head of the Agricultural Office) and in Jakarta (including with the Director of Conservation Areas and the Director of Biodiversity, Species, and Genetic Conservation of MoEF).
- **Biodiversity conservation training and outreach to additional stakeholders:** At the end of 2023, we facilitated a Biodiversity Conservation Training for the Biodiversity Team and the Environment and Sustainable Commodities Team of the British Embassy in Jakarta. The training was a combination of theory sessions in the class and field activities in the Bogani Nani Wartabone landscape. This training aimed to support participants to get a better understanding of biodiversity conservation issues in Indonesia, particularly at the site level in Sulawesi, to inform the design of programmes and priority-setting in supporting the GoI in conserving forest and its unique biodiversity.
- **Information, Education and Communication (IEC) materials:** IEC materials play a vital role in disseminating key messages and promoting behaviour change. WCS developed IEC materials such as short movies, posters, training modules and presentations, and developed a standing booth and podcast (with Bapelitbangda Bolsel). (link to IEC Material: IEC Materials)

4.5 Capacity building

Below is list of the project staff who gained promotions at work during the course of the project:

Name	Gender	Previous Title	Current Title
Mohammad Yakob Botutihe	Male	Field Facilitator	Community Development Officer
Danny Albert Rogi	Male	Sustainable Landscape Coordinator - Sulawesi	Sustainable Landscape Senior Controller Sulawesi
Alfons Patandung	Male	Biodiversity Conservation Officer	Biodiversity Conservation Coordinator
Christomus Bode	Male	SMART Patrol Officer	SMART Patrol Coordinator
Arief Rahman	Male	Biodiversity Research and Monitoring Assistant	Biodiversity Research and Monitoring Officer
Injilyka Walewangko	Female	Terrestrial Program Administration Assistant	Forest Program Administration Officer
Samsu Rijal Marwan	Male	Team Patrol Head	SMART Patrol Team Leader

5 Monitoring and evaluation

We have collected data on the indicators to measure project progress. We also have an environmental and social management plan, and a monitoring and evaluation (M&E) plan that clearly defines the indicators and methodologies to measure progress. We have a reporting and tracking project progress system in place, which is regularly reviewed by both the field team and the team in Bogor. Throughout the project, there were no significant changes made to the monitoring and evaluation plan. WCS has held the overall responsibility for the M&E work within the project, and then for communicating relevant findings to key stakeholders. The M&E system was practical and helpful to the project and for providing feedback to partners, especially as these activities were built into programme design. For example, establishing baselines and measuring progress was the core of activities under Output 1, and sharing information to stakeholders was enabled by additional project activities.

In line with our MoU with the MoEF and the programme implementation plan with BKSDA Sulut and the BNWNP Authority, we submitted quarterly reports on the project progress to the relevant parties. We also held an annual evaluation meeting with BKSDA Sulut and BNWNP to evaluate the project's achievements and to discuss implementation. We also provided regular project updates to the Bappelitbangda of Bolsel District to get their feedback, and communicated the project's progress to key stakeholders through the KEE collaborative forum meeting.

6 Actions taken in response to Annual Report reviews

We received feedback on the 2022 Annual Report and provided our response to issues raised in our 2023 Half Year Report. We have discussed the reviews with our partners and made adjustments to our project strategy and approach accordingly. Following the review, we also presented our safeguarding policy in the annex material.The purpose of this policy is to protect people – particularly children, vulnerable adults and communities with whom we work – from abuse or exploitation that may be caused due to their coming into contact with WCS.

Link to WCS safeguarding policy: Safeguarding Policy

7 Lessons learnt

Community Organization and Engagement:

- The project was successful in securing farmer trust and consent, understanding their needs, interests, and challenges and was able to incorporate these findings in designing the best interventions and therefore gain farmer buy-in to the programme. Our staff spent significant time in the village to establish and maintain communications and good relationships with the farmers.
- The lack of farmer groups or cooperative structures hindered collective action among farmers. This is a key enabling condition for future success, so it is important to build in these activities comprehensively, recognising however that these take time and - as key enablers to success - do not themselves lead to immediate impact on livelihoods and conservation.
- It is important to recognise that changing farmer behaviour, including to adopt new practices, takes time. Farmers often want to witness the impacts of adoption first before investing time or resources in new practices.
- Further recommendations: Project staff should spend significant time in the village to establish and maintain communications and good relationships with farmers. Selection of key farmers is important to increase the effectiveness of project interventions. They can serve as agents of change within the community, demonstrating the benefits of adoption and fostering collection action among farmers. Realistic targets for adoption are imperative, recognising that adoption by key individuals can still have far-reaching and long-lasting impacts.

Diversification of incomes, market access and value addition:

- Through our engagement in the landscape, we were able to successfully identify potential sources of additional income for farmers. However, a lack of market demand for derivative products generated from the utilisation of high economic value commodities in the landscape limited the full potential of developing additional income sources.
- Recommendations: It is important to conduct market analysis for the potential sources of additional income for the farmer. Facilitating discussions with market players, at the right time, is imperative to understanding the feasibility of additional income streams and product sourcing from the landscape.
- We facilitated discussion between farmers and the private sector (PT Cargill) and Cargill also provided co-financing for the project. Cargill expressed their willingness to source coconut and copra from facilitated farmers, however emphasised the need for sufficient volumes in order to pursue full traceability.
- Recommendations: With the limited added value of copra processing, it is recommended that support for the development of derivatives and associated markets is fully built into similar projects as a way to positively impact on farmer livelihoods. Given the challenges, farmers need partners (from government, civil society and the private sector) to increase their capacity and to scale up production and processing activities.

Stakeholder Engagement and Leadership:

- Leadership from the BNWNP Authority, BKSDA Sulut, and Bapelitbangda of Bolsel Disctirct proved effective and key to ensuring the support of key stakeholders for the project. We identified and worked closely with ‘champions’ within these agencies to ensure discussions were translated into real plans and activities, which proved an effective strategy.
- Despite this, restructuring often happens within Government agencies resulting in key persons that had been actively involved in the project being reassigned to other positions that no longer link directly with the project.
- Recommendations: Record all communications with key stakeholders and ensure agreement at the organisational level as well as with the support of key ‘champions’. As far as possible, request that each Government Agency assign a minimum of two representatives to be involved in the project and to participate in meetings.

8 Risk Management

We found several cases where investors were approaching Village Heads to buy land from the community to develop large-scale fish ponds and “porang” farmland. Porang (*Amorphophallus muelleri Blume*) is a tuber plant and raw material for cosmetics, glue, jelly, and has the potential to substitute rice. This would require large-scale land clearing. These investors submitted investment plan proposals to the District Government. In response, we provided technical input to the District Government (directly and through the KEE collaborative forum meeting) to ensure that any investment or development in the Binerean corridor and the surrounding area should be in line with the status of this area as a wildlife refuge. As a result, the District Government rejected these investor’s proposals and asked them to find other potential areas.

9 Sustainability and Legacy

The intended sustainable benefits post-project are still valid. Through the provision of the GAP+ training, farmers acquired new knowledge and skills to improve their farming practices. The benefits of adoption and of practices as evidenced through demonstration plots will extend beyond the project.

We supported the District Government to advance the development of a Sustainable Coconut Roadmap, with new partnerships forged that will further support its development and implementation and will serve as guidance to develop sustainable and wildlife-friendly coconut sector in the district and across the landscape.

We trained BNWNP and FMU Unit II rangers and selected community members to implement SMART Patrol activities. We also trained the BNWNP national park staff to independently conduct remote sensing data analysis, with the acquired skills and knowledge providing benefits that extend beyond the life of the project. SMART Patrol activities have been included in the BNWNP and FMU Unit II long-term and annual working plans, which ensures that in the future the activities will be implemented by BNWNP and FMU Unit II, supported by state budget allocation. The operationalisation of the Integrated Information System of Bogani Nani Wartabone (Sibonawa) will continue to integrate data and results from park activities to inform decision making for the management of the park, which again will extend beyond the project's timeframe and have benefits into the future.

Finally, the management action plan of the ecosystem essential area of the Tanjung Binerean Wildlife Corridor for 2021 - 2025 serves as the guidance for biodiversity conservation and sustainable agricultural production in the landscape. The management action plan has been incorporated into the district's development plan and the KEE collaborative forum will continue to oversee the implementation of the plan beyond this project.

With Darwin Initiative's support, this project has created a strong foundation for biodiversity conservation and sustainable production of agricultural commodities in the landscape into the future. We will continue seeking funding support from public and private donors to continue our biodiversity conservation program in the landscape including to support smallholders' coconut farmers and local governments in the development of a sustainable agricultural sector. This includes continuing our discussion with Cargill to explore further collaboration and with other philanthropic organisations to understand opportunities for further support.

10 Darwin Initiative identity

We have acknowledged the Darwin Initiative's important support throughout our communications with all stakeholders. We have developed public communications materials for the project. As we aim to encourage ownership and leadership by BNWNP and BKSDA Sulut, in line with our MoU with MOEF, and as part of our sustainability strategy, we have produced joint materials with BNWNP and BKSDA Sulut, such as modules, banners, and signs, and short movies, each of which also acknowledge the Darwin Initiative's support (including by using the Darwin Initiative logo). WCS was also pleased to recognise the Darwin Initiative in WCS's 2023 Annual Report. Following the implementation of the project activities, particularly from the meetings and workshops with the stakeholders at the district level, and field activities, several local newspapers have published articles related to the project (see Annex 5).

11 Safeguarding

Has your Safeguarding Policy been updated in the past 12 months?	~~Yes~~/No
Have any concerns been investigated in the past 12 months	~~Yes~~/No
Does your project have a Safeguarding focal point?	Yes/~~No~~ [*If yes, please provide their name and email]* Fitria [redacted] Shanti [redacted] Annisa [redacted]
Has the focal point attended any formal training in the last 12 months?	Yes/~~No~~ [*If yes, please provide date and details of training*] Yes, including the following: GenderPro Capacity Building Program from George Washington University (Jan-May 2024): The training aims to improve the knowledge and skills that are necessary to integrate gender into international development programming Social and Behavioural Research Training (27 November 2023): to understand the ethical principles, regulations and policies in conducting human subject-related research. Training on Working with Stories using Participatory Narrative Inquiry (PNI) (24 Oct - 12 Dec 2023): The training was conducted to build the capacity of WCS staff in Indonesia in using the PNI as a tool in raising awareness on Gender Equality and Social Inclusion (GESI) issues and assessing the current situation in the organization and community on gender issues. Sensitization Training on Human Rights-Based Approach to Conservation (22-25 Sep 2023): The training aimed to provide materials sensitizing WCS program personnel to a human rights-based approach and equipping them with tools to safeguard and protect the rights of stakeholders through mechanisms such as FPIC, GRM, IRB, and access mitigation. Training of Trainers (ToT) on Basic Necessities Survey (BNS) and Natural Resources Governance Tool (28 Aug - 8 Sep 2023): This ToT aimed to equip the WCS staff in the process of data collection and data analysis in BNS and NRGT, Kobo Toolbox, ethics in human subject research, and conservation standards. Training of Trainers (ToT) on Conservation Social Safeguards and Sciences (17-21 July

	2023): WCS Global conducted the ToT to ensure that WCS Social Safeguards and Rights + Communities Country and Regional focal points have the basic skills to train WCS staff and partners in marine and terrestrial sites on core competencies related to Human Rights, Social Safeguards, and Community Engagement.
What proportion (and number) of project staff have received formal training on Safeguarding?	Past: 42% [9 person] Planned: N/A [and number]
Has there been any lessons learnt or challenges on Safeguarding in the past 12 months? Please ensure no sensitive data is included within responses. By following our policy and guideline, we did not confront any challenges on safeguarding in the past 12 months.	

12 Finance and administration

12.1 Project expenditure

Project spend (indicative) since last Annual Report	**2023/24 Grant (£)**	**2023/24 Total actual Darwin Costs (£)**	**Variance %**	**Comments (please explain significant variances)**
Staff costs (see below)	[redacted]			
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (see below)				
Others (see below)				
Audit costs				
TOTAL	202,903.00	202,903.00		

Staff employed (Name and position)	Cost (£)
Noviar Andayani-Country Director Indonesia	[redacted]
William Marthy-Deputy Country Director Indonesia	
Martin Callow-Regional Director	
Madeleine Xavier-Regional Business Manager	
Leonie Lawrence-Regional Commodities Specialist (Singapore)	
Titiek Setyawati-SL Program Manager	
Iwan Hunowu-Sulawesi Program Manager	
Saddam Husein-Biodiversity Specialist	
Oktafa Rini -Biodiversity Officer	
Christomus Bode-SMART Coordinator	
Arief Rahman-SMART Officer	
Herman Teguh-Protected Area Specialist	
Alfons Patandung-Spatial Analyst Specialist	
Adhie Trisna-Team Leader/ Coordinator landscape	
Halim Wadipolapa-Agronomist/trainer	
Sinta Aliks-Program Support Officer	
Maria Helena Yeni Pareira-Senior Researcher Market and Commodity	
Astrid Soraya Fitriani-M&E Specialist	
Nur Afni-Finance/Grant Manager	
Imelda Jostein-Senior Finance/Grant Officer	
Lisa Lumempouw-Admin/HR Assistant	
TOTAL	**£76,531.53**

Capital items – description	Capital items – cost (£)
TOTAL	

Other items – description	Other items – cost (£)
Bank Fees Communications and Internet Courier Service Utilities Office rent Office Supplies VAT	[redacted]
TOTAL	**£832.64**

12.2 Additional funds or in-kind contributions secured

Source of funding for project lifetime	Total (£)
Cargill	[redacted]
The Silent Foundation	
TOTAL	**108,529**

Source of funding for additional work after project lifetime	Total (£)
TOTAL	

12.3 Value for Money

This project has created positive impacts across the 430,000 hectare landscape, which includes BNWNP, FMU Unit II, and the Tanjung Binerean wildlife corridor. We strengthened the capacity of BNWNP and FMU Unit II staff and the KEE collaborative forum and supported the formulation and implementation of their long-term management plans. We also leveraged co-financing from Cargill to maximise our reach and efficiency in the provision of technical assistance for >500 coconut. Through our collaborative work with communities in the development of sustainable agriculture that supports biodiversity conservation and through alignment with government policy and private sector interest, we can maximise the impact to the sustainability of livelihoods and biodiversity conservation in the landscape.

The project has generated lessons and supported the government and private sector to replicate this approach across landscape and sectors, including at the provincial level, by providing an environmentally-friendly economic development pathway that incentivises sustainable land-use practices.

The project has been underpinned by strong budget management and monitoring and evaluation, and WCS's policies and procedures (e.g. linked to procurement), to ensure the effective and efficient use of funds, and to ensure that interventions respond and adapt to risks. This has been supported by WCS's grant management team, which focuses on project financial planning, and the finance team, which focuses on financial management, bookkeeping, and auditing. We have followed and complied with WCS's procurement procedures designed to achieve value for money and to ensure that budget management is based on both economic value and obtaining inputs of the best quality and quantity.

OPTIONAL: Outstanding achievements of your project (300-400 words maximum). This section may be used for publicity purposes.

Following WCS MoU with the MoEF, all publication of data, analysis result, reports, and other materials from WCS's work in Indonesia must be reviewed and obtain prior approval from the MoEF before publication. Thereby, we can not provide our consent for any publication without MoEF approval.

Annex 1 Project's original (or most recently approved) logframe, including indicators, means of verification and assumptions.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Impact: Biodiversity and forests in the landscape are well protected and restored by empowered community and government partners, and communities have viable livelihoods from the production of deforestation-free agricultural commodities			
Outcome: A replicable, integrated forest management strategy is implemented through collaborative partnerships, demonstrating increased agricultural yields, income and wellbeing for >500 farmers, whilst securing high conservation value forests and critical watersheds.	1.1. By Yr3, 1 landscape production-protection model is developed and underpinned by a 'zero deforestation commitment' that is signed and enacted through a government, private, community and NGO partnership (baseline 0). 1.2. By Yr3, rate of forest clearance in the target landscape is reduced by >20% compared to project baseline (to be determined in Yr1) and the border of BNWNP is secured 1.3. By Yr3, population trends of at least 2 of 4 endangered and national priority species (lowland anoa, babirusa, black-crested macaque, maleo) have increased by >10% compared to project baseline (to be determined in Yr1). 1.4. By Yr3, >500 farmer households in target communities have increased indices for wellbeing (at least 50% women), including a 10% increase in income and identified opportunities for	1.1. Project report and strategy document on production-protection model (Yr1); Letters of Intent that demonstrate a "zero deforestation commitment" signed by all of the key project stakeholders (Yr1); minutes from sustainable coconut roundtable meetings (Yr1-3). 1.2. Forest cover change assessment for pre-project (5 years before) and project period (Yr3) with a remote sensing dataset. 1.3. Camera trap survey datasets and results (Yrs1&3). 1.4. Baselines of community livelihood indicator data and repeat socio-economic survey comparative datasets (Yrs1&3).	Stakeholders recognise the need for, and benefits of, a new approach to improve forest management and farmer livelihoods. Improvement in yields and opportunities for income diversification through other commodities do not coincide with commodity price decreases. The project is able to overcome COVID-19 impacts on travel, meetings, training and surveys through designing and implementing a series of practical safety measures that are regularly reviewed and modified, as needed.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
	income diversification, compared to baseline data collected at the start of the project when selecting project beneficiaries. 1.5. By Yr3, >GBP150,000 in private sector financing leveraged for project continuation over the medium-term (baseline = 0).	1.5. Signed financial commitment (LoI or agreement) by private sector to support thematic livelihood and biodiversity work packages; press releases (Yr3).	
Outputs: An assessment framework and monitoring system is established across the landscape, enabling the BNWNP and FMU authorities and the multi-stakeholder partnership to implement and adapt approaches within a forest management strategy that integrates forest protection, restoration and sustainable agricultural production.	1.1. Key indicators for biodiversity, farmers, flooding, deforestation and additional social and environmental indicators identified by Yr1 (baseline = 0) 1.2. Baseline established by Yr1, and a system developed by Yr3 to monitor forest, farmland, land use change flooding and other key environmental indicators (baseline = 0). 1.3. Baseline established by Yr1 and trends established by Yr3 for population and habitat condition of four priority species (baseline = 0) 1.4. Baseline socio-economic conditions for >500 farmers established by Yr1 and trends for at least 50% of participating farmers known by Yr3 (baseline = 0).	1.1. Final list of indicators and assessment framework. 1.2. Land use monitoring system, including time-series datasets and statistics for spatial data layers; reports on information dissemination workshops with government partners (Yrs1&3). 1.3. Training and field survey reports; camera trap datasets; peer-reviewed scientific publications (Yrs1&3). 1.4. Socio economic data management system, including field survey data and analytical reports (Yrs 1&3).	Satellite imagery is available, accurate and cost-effective to access. Communities trust field teams and so provide accurate information on socio-economic conditions and needs.
>500 smallholder farmers in Bolsel are committed to forest protection and	2.1. 1 multi-stakeholder forum established, with joint commitment	2.1. Minutes of meeting; legal forum establishment document; signed joint	Stakeholders recognise the risk of commodities production associated with

Project summary	Measurable Indicators	Means of verification	Important Assumptions
restoration, and have viable livelihoods from sustainable agriculture practices, supported by a multi-stakeholder partnership	supported by 3 government agencies, >5 community groups, Cargill and >2 NGOs/ CSOs (Yr1), which leads to the development of a forest management strategy that integrates forest protection, restoration, and sustainable agricultural production (Yr2) (baseline = 0) 2.2. By Yr 1, farmer mapping and needs assessment conducted for >500 farmers in Bolsel (baseline = 0) 2.3. By Yr 2, 5 community conservation agreements signed (baseline = 0) 2.4. By Yr 1, agricultural assessment and supply chain risks and opportunities for income diversification identified (Yr1) (baseline = 0) 2.5. Farmer training programme (in Good Agricultural Practices and Institutional Strengthening) developed (by Yr1) and delivered, including intensive training to >300 farmers (by Yr3) (baseline = 0) 2.6. By Yr3, 1 feasibility assessment and draft business plan for small-scale organic virgin coconut oil enterprise developed (baseline=0) or for other potential sources of income	commitment; press releases, media coverage and company website coverage (Yr1); project strategy document (Yr2); minutes from information dissemination workshops with partner (Yr3). 2.2. Farmer needs assessment; dataset on Bolsel farming communities (Yr1). 2.3. Minutes of meetings and signed agreements from community partners (Yr2). 2.4. Field survey and value chain analysis report, including recommendations for income diversification (Yr1). 2.5. Document of training curricula and modules (Yr1); M&E reports on farmer training (Yr3) 2.6. Minutes of meetings; business plan document; press releases (Yr3).	deforestation to the future of agricultural sectors and the community livelihood. Communities recognise the value of forest protection and restoration and trust that benefits from improved agricultural practices will improve their livelihoods. Farmers adopt practices from training in their own farms.
A co-management model for protecting biodiversity, forest and ecosystem services is designed and implemented across the landscape.	3.1. 1 co-management plan developed to protect the target landscape (139,400 ha) of high conservation value forest (Yr2) (baseline 0).	3.1. Consultation workshop reports; GIS and field survey data and report; legal document for co-management plan (Yr2).	Decision makers consider science-based evidence in landscape management.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
	3.2. 2 well-trained community-government ranger teams are supported to patrol >200 km/ year in BNWNP/ FMU and conduct outreach in 5 villages/ year (Yrs2&3) (baseline 0).	3.2. Training and field reports; field and GIS datasets; data recorded in SMART patrol system and outputs, such as maps, tables and graphs (Yrs2&3).	Key stakeholders recognise the need to develop an integrated science-based management plan as the landscape consists of different land use types and functions that fall under different management authorities. From this, the co-management model is jointly developed by the relevant stakeholders, who are fully informed of the plan, their respective roles within it, and fully support its implementation.
	3.3. Rehabilitation process started on >200 ha of degraded watershed forest with active participation of communities (Yr3) (baseline = 0).	3.3. Field manual and report (Yr2); GIS and field survey datasets (Yr3).	These stakeholders are also willing and able to adapt the intervention strategy based on the applied research findings that emerge over the project years.
	3.4. >10 small grants to young Indonesian conservationists to conduct applied conservation and agroforestry research projects (Yrs 1-3) (baseline 0).	3.4. Training reports; field data sets, research reports, presentations and dissemination workshops; peer-reviewed scientific publications (Yr1-3).	
	3.5. At least 4 government-led stakeholder consultation workshops to compile and then disseminate project results and lessons learned to village, district, provincial and national level partners (Yr3) (baseline 0).	3.5. Workshop reports; project presentations; Policy brief (Yr3).	

Activities (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1)

1.1. Develop biodiversity, farmer socio-economic, flooding and deforestation indicators in consultation with project stakeholders.

1.2. Develop a land-use monitoring system to establish farmland, forest and flooding risk baselines, identify priority areas, create deforestation alerts and monitor project progress.

1.3. Conduct biodiversity surveys and assess trends of priority species and their forest habitat across the landscape.

1.4. Conduct farmer surveys to assess socio-economic conditions of farmers across the landscape.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
2.1. Engage government, private sector and community stakeholders to establish a multi-stakeholder forum that develop a strategy for integrated forest protection, restoration and sustainable agricultural production. 2.2. Conduct farmer needs assessment, including knowledge and application of GAP, farmer organisation, assessment of access to inputs, markets and finance. 2.3. Conduct Participatory Rural Appraisal with communities to develop conservation agreements and identify challenges, needs and opportunities. 2.4. Assess landscape agricultural, value chain and alternative livelihood opportunities 2.5. Design and deliver a farmer training programme on GAP, institutional strengthening, support for rehabilitation, agroforestry and intercropping 2.6. Conduct a feasibility assessment for value addition in the coconut supply chain and other potential additional sources of income, and develop draft business plan 3.1. Conduct multi-stakeholder meetings to jointly develop and support implementation of co-management plan in high conservation value forests 3.2. Train and support community-government ranger teams to patrol BNWNP and FMU and conduct community outreach 3.3. Establish restoration, supported by government with active participation of communities, in degraded watershed forests 3.4. Conduct applied conservation and agroforestry research in the landscape 3.5. Hold government-led stakeholder consultation workshops to compile and then disseminate project results and lessons learned to village, district, provincial and national level partners.			

Annex 2 Report of progress and achievements against final project logframe for the life of the project

Project summary	Measurable Indicators	Progress and Achievements
Impact: Biodiversity and forests in the landscape are well protected and restored by empowered community and government partners, and communities have viable livelihoods from the production of deforestation-free agricultural commodities.		Positive trends for forests (reduced deforestation) and biodiversity (increases in populations of priority MoEF species) assessed; government partners empowered to continue SMART patrols and conduct independent and integrated monitoring through satellite imagery analysis and the operational *Sibonawa* system; yield improvements demonstrated through application of GAP, farmers trained and alternative income sources identified.
Outcome A replicable, integrated forest management strategy is implemented through collaborative partnerships, demonstrating increased agricultural yields, income and wellbeing for >500 farmers, whilst securing high conservation value forests and critical watersheds	1.1. By Yr3, 1 landscape production-protection model is developed and underpinned by a 'zero deforestation commitment' that is signed and enacted through a government, private, community and NGO partnership (baseline 0). 1.2. By Yr3, rate of forest clearance in the target landscape is reduced by >20% compared to project baseline (to be determined in Yr1) and the border of BNWNP is secured 1.3. By Yr3, population trends of at least 2 of 4 endangered and national priority species (lowland anoa, babirusa, black-crested macaque, maleo) have increased by >10% compared to project baseline (to be determined in Yr1).	1.1. KEE Forum has developed a management action plan that reflects the commitment of stakeholders for the production-protection model. We supported the Roadmap of Sustainable Coconut Industry and Wildlife Conservation Advancement. 1.2. From our analysis, there was a 24% reduction in deforestation rate in the landscape (from 0.33%/year in 2015-2020 to 0.25%/year in 2020-2021). 1.3. Species population trends: • 84% increase in the number of breeding population of maleo in the permanent sample plot; 13 pairs in 2021 to 24 pairs in 2023. • >32% increase in the occupancy rate of anoa; 0,53 (95% confidence interval 0.34-0.73; standard error 0.09) in 2021 to 0.70 (95% confidence interval 0.58-0.78, and standard error 0.10) in 2023.

Project summary	Measurable Indicators	Progress and Achievements
		• >21% increase in the occupancy rate of babirusa; 0.61 (95% confidence interval 0.43-0.71; standard error 0.08) in 2021 to 0.74 (95% confidence interval 0.61-0.78, and standard error 0.10) in 2023.
	1.4. By Yr3, >500 farmer households in target communities have increased indices for wellbeing (at least 50% women), including a 10% increase in income and identified opportunities for income diversification, compared to baseline data collected at the start of the project when selecting project beneficiaries.	1.4. We trained >500 farmers, providing the basis of improved incomes and wellbeing of 500 farming households. We identified an increase in farmer wellbeing in other aspects such as strengthened social relations, increased farmer capacity, freedom of choice and action related to the management of natural resources in their village and wider landscape. Our socio economic survey also revealed an increase in farmer household incomes (<10% in Mataindo Utara Village, and >100% in other facilitated villages), with a total of 425 respondents. However along with the increased income, farmer household expenditure also increased.
	1.5. By Yr3, >GBP150,000 in private sector financing leveraged for project continuation over the medium-term (baseline = 0).	1.5. PT. Cargill provided co-funding for the project initially. We have been exploring options for their continued support but are yet to finalise this. Cargill has however indicated their willingness for continued engagement, and, in discussion with Bolsel District Government, committed to support farmer communities in the landscape through their CSR Program.
Output 1. An assessment framework and monitoring system is established across the landscape, enabling the BNWNP and FMU authorities and the multi-stakeholder partnership to implement and adapt approaches within a forest management strategy that integrates forest protection, restoration and sustainable agricultural production.	1.1. Key indicators for biodiversity, farmers, flooding, deforestation and additional social and environmental indicators identified by Yr1 (baseline = 0)	1.1. We have listed the indicators for biodiversity, farmers socio-economic, deforestation, and flooding risk. Link to means of verification: MoV 1.1.
	1.2. Baseline established by Yr1, and a system developed by Yr3 to monitor	1.2. We have established the baseline in Yr 1 and continued to monitor progress through the monitoring system. In Yr 2 we trained the BNWNP staff to independently

Project summary	Measurable Indicators	Progress and Achievements
	forest, farmland, land use change flooding and other key environmental indicators (baseline = 0).	conduct remote sensing data analysis and to be able to maintain dan analysis data and information collected into Sibonawa (https://www.sibonawa.org/login) Link to means of verification: MoV 1.2.
	1.3. Baseline established by Yr1 and trends established by Yr3 for population and habitat condition of four priority species (baseline = 0)	1.3. In Yr1, we compiled baseline data for the population and habitat conditions of four key species in the landscape including lowland anoa (*Bubalus depressicornis*), maleo (*Macrocephalon maleo*) and the black-crested macaque (*Macaca nigra*). Link to means of verification: MoV 1.3.
	1.4. Baseline socio-economic conditions for >500 farmers established by Yr1 and trends for at least 50% of participating farmers known by Yr3 (baseline = 0).	1.4. Following the farmer socio economic survey in Yr1, we compiled baseline socio-economic data.
Activity 1.1 Develop biodiversity, farmer socio-economic, flooding, and deforestation indicators in consultation with project stakeholders		1.1. We have developed and listed the indicators for biodiversity, farmer socio-economic, flooding and deforestation, including in consultation with stakeholders.
Activity 1.2. Develop a land-use monitoring system to establish farmland, forest and flooding risk baselines, identify priority areas, create deforestation alerts and monitoring project progress		1.2. We have established the deforestation baseline in Yr1 and in Yr2 we conducted farmer registration and farm land mapping. We completed the registration and farm land mapping by Yr3. We have empowered the BNWNP Authority to conduct independent satellite imagery analysis and supported the operationalisation of the Sibonawa system.
Activity 1.3 Conduct biodiversity surveys and assess trends of priority species and their forest habitat across the landscape		1.3. We have conducted biodiversity surveys for four key species, including anoa (*Bubalus depressicornis*), babirusa (Babyrousa celebensis), maleo (*Macrocephalon maleo*), and the black-crested macaque (*Macaca nigra*). Compared to Yr1, the breeding population and probability occupancy of maleo and anoa increased.
Activity 1.4. Conduct farmer surveys to assess socio-economic conditions of farmers across the landscape		1.4. We have conducted farmer survey to assess socio economic condition of farmers in the five facilitated villages

Project summary	Measurable Indicators	Progress and Achievements
Output 2. >500 smallholder farmers in Bolsel are committed to forest protection and restoration, and have viable livelihoods from sustainable agriculture practices, supported by a multi-stakeholder partnership	2.1. 1 multi-stakeholder forum established, with joint commitment supported by 3 government agencies, >5 community groups, Cargill and >2 NGOs/ CSOs (Yr1), which leads to the development of a forest management strategy that integrates forest protection, restoration, and sustainable agricultural production (Yr2) (baseline = 0)	2.1 We did not establish a new multi-stakeholder forum, but decided to strengthen the KEE collaborative forum, a multistakeholder forum, which consists of representatives of Bolsel District Planning and Development Agency, Bolsel District Forestry Agency, Bolsel District Agricultural Agency, BNWNP Authority, BKSDA Sulut, Bolsel District Tourism Agency, four Villages in Bolsel District, and WCS. The KEE collaborative forum has developed a long term management action plan for the period of 2021 - 2025. In addition we supported the District Government in the formulation of the Roadmap of Sustainable Coconut Industry and Wildlife Conservation. Link to means of verification: MoV 2.1.
	2.2. By Yr 1, farmer mapping and needs assessment conducted for >500 farmers in Bolsel (baseline = 0)	2.2. We have conducted farmer need assessments using FGDs and Rapid Rural Assessment techniques. We have completed farmers mapping in the five pilot villages and mapped 1,212 plots of farmland in the landscape. Link to means of verification: MoV 2.2.
	2.3. By Yr 2, 5 community conservation agreements signed (baseline = 0)	2.3. In Yr2, we have secured five community conservation agreements. Link to means of verification: MoV 2.3.
	2.4. By Yr 1, agricultural assessment and supply chain risks and opportunities for income diversification identified (Yr1) (baseline = 0)	2.4. We have mapped coconut supply chain risk and opportunities, and identified potential sources of additional income generation that exist in the landscape. Link to means of verification: MoV 2.4.

Project summary	Measurable Indicators	Progress and Achievements
	2.5. Farmer training programme (in Good Agricultural Practices and Institutional Strengthening) developed (by Yr1) and delivered, including intensive training to >300 farmers (by Yr3) (baseline = 0)	2.5. We have developed GAP training materials that consist of 7 modules. In collaboration with the Bolsel District's Agricultural Agency, BSIP, and PT. Cargill and have delivered GAP training to 592 farmers. Link to means of verification: MoV 2.5.
	2.6. By Yr3, 1 feasibility assessment and draft business plan for small-scale organic virgin coconut oil enterprise developed (baseline = 0) or for other potential sources of income identified in year 1 and 2	2.6. We have identified other potential sources of income in the villages. We conducted the feasibility assessment in the Yr3. The main challenge in developing additional sources of income is the lack of capacity in production and the lack of market for these products. Based on this, it has been considered to be more strategic to focus on improving farmer capacity in producing these products, while facilitating communication with the market players, before developing a business plan that risks raising community expectations prematurely. We do however have indications of the potential additional sources of income possible associated with different options for value additional and derivative products, forming the basis for the business plan development. Link to means of verification: MoV 2.6.
Activity 2.1. Engage government, private sector and community stakeholders to establish a multi-stakeholder forum that develops a strategy for integrated forest protection, restoration and sustainable agricultural production		As explained previously, we decided to strengthen the KEE collaborative forum. The forum has decided to hold a meeting every semester, to develop a strategy for integrated forest protection and sustainable agricultural production in the landscape.
Activity 2.2. Conduct farmer needs assessment, including knowledge and application of GAP, farmer organisation, assessment of access to inputs, market and finance.		We have engaged 867 farmers from five pilot villages in the landscape, of which 498 farmers have committed to participate in the GAP training and apply GAP in their farming practices.
Activity 2.3 Conduct Participatory Rural Appraisal with communities to develop conservation agreements and identify challenges, needs and opportunities		We have secured 5 conservation agreements with communities in each pilot village on a voluntary basis.
Activity 2.4. Assess landscape agricultural, value chain and alternative livelihood opportunities		We have mapped coconut supply chain risk and opportunities, and identified potential sources of additional income generation that exist in the landscape
Activity 2.5. Design and deliver a farmer training programme on GAP, institutional strengthening, support for rehabilitation, agroforestry, and intercropping		We have developed seven modules of training materials. We delivered GAP+ training to 592 farmers. In collaboration with BNWNP, FMU Unit II Bolsel, and

Project summary	Measurable Indicators	Progress and Achievements
		BKSDA North Sulawesi, BSIP, we trained 25 key farmers from the five pilot villages as the agent of change within the community.
Activity 2.6. Conduct a feasibility assessment for value addition in the coconut supply chain and other potential additional sources of income, and develop draft business plan		We have completed the feasibility assessment for value addition in the coconut supply chain and identified potential additional sources of income for the farmer. We delivered training on the development of additional sources of income for 97 farmers (90 female and 7 males).
Output 3. A co-management model for protecting biodiversity, forest and ecosystem services is designed and implemented across the landscape	3.1. 1 co-management plan developed to protect the target landscape (139,400 ha) of high conservation value forest (Yr2) (baseline 0)	We worked with all key stakeholders within the KEE collaborative forum to develop the management action plan for the Tanjung Binerean Wildlife Corridor as well as the long term management plan of BNWNP and FMU-II. The management plan has been incorporated into the District development plan. We have also supported the District Government in the formulation of the Roadmap of Sustainable Coconut Industry and Wildlife Conservation. Link to means of verification: MoV 3.1.
	3.2. 2 well-trained community-government ranger teams are supported to patrol >200 km/year in BNWNP/FMU and conduct outreach in 5 villages/year	In Yr2, we delivered SMART Patrol training for 31 staff of BNWNP. In Yr3 we delivered SMART patrol mentoring for FMU II SMART Patol data operators including 5 newly assigned staff. In total this is >2 teams. Between 2021-2023, WCS and BNWNP team conducted SMART Patrol over 3,128.89 km. Meanwhile WCS and FMU Unit II team conducted SMART Patrol over 444.22 km Link to means of verification: MoV 3.2.
	3.3. Rehabilitation process started on >200 ha of degraded watershed forest with active participation of communities (Yr3) (baseline=0)	Based on the forest and land cover change analysis, we have identified degraded areas within the BNWNP and FMU area and its buffer zone. Whilst from the farm mapping, we have identified farmland inside BNWNP and FMU area. In Yr3, we conducted restoration activities through seedling distribution and planting in collaboration with BNWNP and FMU authorities and the communities in Binerean corridor covering an estimated 336 hectares of land Link to means of verification: MoV 3.3.
	3.4. >10 small grants to young Indonesian conservationists to conduct applied conservationists and agroforestry research projects (Yrs1-3)(baseline 0)	WCS collaborated with the University of Sam Ratulangi to promote the Research Fellowship Program. To date, we have provided 6 small grants to young Indonesian conservationists to conduct applied conservation and agroforestry research project Link to means of verification: MoV 3.4.

Project summary	Measurable Indicators	Progress and Achievements
	3.5. At least 4 government-led stakeholder consultation workshops to compile and then disseminate project results and lessons learned to village, district, provincial and national level partners (Yr3) (baseline 0)	3.5. >4 meetings held, including In collaboration with the Provincial and District Government, and two international events such as World Maleo Day and World Coconut Day. Link to means of verification: MoV 3.5.
Activity 3.1. Conduct multi-stakeholder meetings to jointly develop and support implementation of co-management plan in high conservation value forests		We support the KEE collaborative forum to hold regular meetings.
Activity 3.2. Train and support community-government ranger teams to patrol BNWNP and FMU and conduct community outreach		Along with community-government ranger teams, we have delivered a total of 3,573.11 km in FMU II and BNWNP. Together with BNWP and FMU II staff, our team conducted outreach activities in the five villages to raise community awareness on the importance of wildlife and forest conservation, and its interconnection with the agricultural activities.
Activity 3.3. Establish restoration, supported by government with active participation of communities, in degraded watershed forests		We have identified degraded areas within the BNWNP and FMU area and its buffer zone. We have identified farmland inside BNWNP and FMU area.
Activity 3.4. Conduct applied conservation and agroforestry research in the landscape		We provided 6 small grants to young Indonesian conservationists to conduct applied conservation and agroforestry research project in the landscape
Activity 3.5. Hold government-led stakeholder consultation workshops to compile and then disseminate project results and lessons learned to village, district, provincial and national level partners		In Yr2, we shared the project progress to stakeholders with the Bolsel Government, NAM CSSTC, and other stakeholders. In Yr3 we disseminated the project result and lessons learned obtained by the project through various events at the district, provincial, national and international level.

Annex 3 Standard Indicators

Table 1 Project Standard Indicators

Indicator number	Darwin Initiative Standard Indicator	Name of Indicator after adjusting wording to align with DI Standard Indicators	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
DI-A06	Farmer training programme (in Good Agricultural Practices and Institutional Strengthening) developed (by Yr1) and delivered, including intensive training to >300 farmers (by Yr3)	Numbers of people with improved access to service for improved well-being	People	Gender	-	367	225	592	300
DI-D11	Farmer training programme (in Good Agricultural Practices and Institutional Strengthening) developed (by Yr1) and delivered, including intensive training to >300 farmers (by Yr3)	Number of people benefitting from improved sustainable agriculture practices and are more resilient to weather shocks and climate trends	People	Gender	-	367	225	592	300
DI-A07	One multistakeholder forum established, with joint commitment supported by 3 government agencies, >5 community groups, Cargill and >2 NGOs/CSOs (Yr1), which leads to the development of a forest management strategy that integrates forest protection, restoration, and sustainable agricultural production (Yr2)	Number of government institutions/departments with enhanced awareness and understanding of biodiversity and associated poverty issues	Government institutions	Government organization type - Province : 9 institutions - Region/districts : 11 institutions - Village: 7 institutions - Government at village level: 5 institution - Private sector: 1 - CSOs: 2	-	9	-	9	3

Table 2 Publications

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)
A bolder conservation future for Indonesia by prioritising biodiversity, carbon, and uniques ecosystem in Sulawesi*	Journal	Wulan Pusparini, Andi Cahyani, Hedley S. Grantham, Sean Maxwell, Carolina Soto-Navarro, David W, MacDon	Female	Indonesian	Nature (https://www.nature.com/nature/journal-information)	https://doi.org/10.1038/s41598-022-21536-2
Genetic Diversity of the Endangered Endemic Anoa (Bubalus spp): Implication for Conservation*	Journal	Dwi Sendi Priyono, Dedy Duryadi Solhin, Achmad Farajallah, Bambang Purwantara	Male	Indonesian	Hayati Journal of Biosciences (https://journal.ipb.ac.id/)	https://doi.org/10.4308/hjb.29.5.586-596
Two decades of managing Maleo Macrocephalon maleo reproduction at Tambun, North Sulawesi, and its population estimates within the Bogani Nani Wartabone landscape*	Journal	Hanom Bashari, Iwan Hunowu, Alfons Patandung, Richard An Noske	Male	Indonesian	ResearchGate (https://www.researchgate.net)	https://www.researchgate.net/profile/Hanom-Bashari/publication/369762040_Two_decades_of_managing_Maleo_Macrocephalon_maleo_reproduction_at_Tambun_North_Sulawesi_and_its_population_estimates_within_the_Bogani_Nani_Wartabone_landscape/links/642bb0d320f25554da0a3386/Two-decades-of-managing-Maleo-Macrocephalon-maleo-reproduction-at-Tambun-North-Sulawesi-and-its-population-estimates-within-the-

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)
						Bogani-Nani-Wartabone-landscape.pdf

Note: these scientific publications is not specifically for this Darwin Initiative-funded project, but the implementation of this project contributed to these publications.

30. Checklist for submission

	Check
Is the report less than 10MB? If so, please email to BCF-Reports@niras.com putting the project number in the Subject line.	✓
Is your report more than 10MB? If so, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line.	✗
If you are submitting photos for publicity purposes, **do these meet the outlined requirements (see section 10)?**	✓
Have you included means of verification? You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	✓
Do you have hard copies of material you need to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number. However, we would expect that most material will now be electronic.	✗
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see section 10)?	✓
Have you involved your partners in preparation of the report and named the main contributors	✓
Have you completed the Project Expenditure table fully?	✓
Do not include claim forms or other communications with this report.	