



To be completed with reference to the “Writing a Darwin/IWT Report” Information Note:  
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It is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)

### Darwin Project Information

Project reference	24-016
Project title	Sustainable community-based stewardship of freshwater resources in the Northern Philippines
Country(ies)	Philippines
Lead organisation	Zoological Society of London (ZSL)
Partner institution(s)	Bureau of Fisheries and Aquatic Resources (BFAR); Department of Environment and Natural Resources (DENR)
Darwin grant value	£378,174
Start/end dates of project	1/7/2017 to 31/08/2021
Project leader’s name	Dr Matthew Gollock
Project website/blog/ social media	<a href="https://twitter.com/ZSLMarine">https://twitter.com/ZSLMarine</a> <a href="https://www.facebook.com/freshwaterconservationproject/">https://www.facebook.com/freshwaterconservationproject/</a>
Report author(s) and date	Matthew Gollock, Alejandro Belen, Emma Levy, Surshti Patel, Franklin Piad and Mae-Ann Rabina.

## 1 Project Summary

An estimated 126,000 described species rely on freshwater (<https://www.iucn.org/theme/species/our-work/freshwater-biodiversity>), and this biome exhibited species’ population declines of 83% between 1970 and 2012 ([Living Planet Report, 2018](#)). The Convention on Biological Diversity (CBD) states that globally, freshwater habitats and associated biodiversity are impacted by unsustainable use, construction, land conversion, pollution and invasive alien species. This is echoed in both the [4<sup>th</sup>](#) and [5<sup>th</sup>](#) Philippines National Report to the CBD (NRCBD), which highlighted that freshwater systems require urgent conservation attention. Indeed, in the [6<sup>th</sup> NRCBD](#) it was indicated that the Bureau of Fisheries and Aquatic Resources (BFAR) had created a specific sub-committee to address the conservation status of freshwater bony fishes. The study area is the Cagayan River Basin (CRB) in Region 2 of Luzon, Philippines, the largest freshwater body in the country. Habitat surveys in our previous project (21-020) identified threats including deforestation, ‘slash and burn’ agriculture, erosion and siltation, abstraction, unmanaged exploitation, stocking with exotic tilapia and expansion of settlements due to rising populations, which will generally increase the pressure on freshwater resources. Research from the present study has indicated that other invasive species, such as the janitor fish, are now found in the CRB. Some of these threats have provided the basis of both our biological and socio-economic interventions, and these were tailored such that we can capitalise on the expertise of our partners (see Section 2).

If the freshwater systems continue to be impacted by these activities without intervention, the communities that rely upon them will lose essential ecological, economic and cultural resources. The core of this project was community engagement, and over the three years of our previous project and the four years that we have been implementing the present project we have built relationships with key stakeholders that has ensured buy-in at the local level. The protection and management of freshwater biodiversity, and by association, the success of the project, was reliant on the Freshwater Sanctuaries (FS) being managed effectively by local stakeholders and we have been heartened by the enthusiasm shown by the communities and associated governance units that are linked to them.

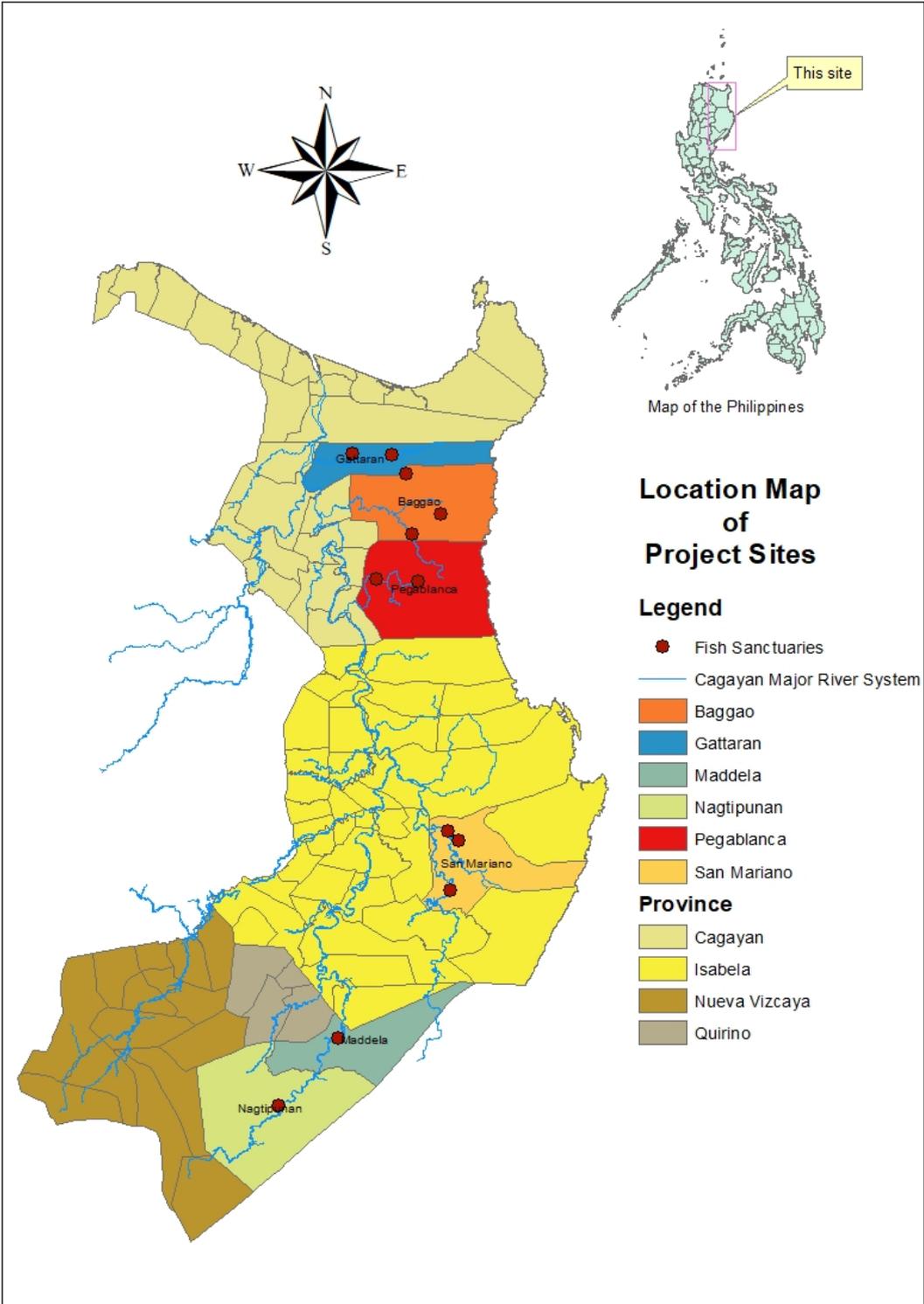


Figure 1. Maps of study area and Freshwater Sanctuary locations).

## **2 Project Partnerships**

The present project was collaboratively implemented with national agencies and local government units – all of whom were engaged during the drafting of this report. Partners were active in supporting the project implementation as technical experts as well as serving on the Technical Working Group (TWG) that oversaw implementation.

### **Bureau of Fisheries and Aquatic Resources (BFAR)**

BFAR has been a key partner in our work since the establishment of the previous Darwin project (21-020) in 2014. In the current project, BFAR actively oversaw the implementation of FS management plans (FSMPs) through relevant staff within Provincial Fisheries Offices. They also gave technical support to FS, community monitoring groups (CMGs) and river wardens in patrolling and monitoring key sites. BFAR provided technical input to the law enforcement and para-legal training of river wardens (Annex 7). We worked with BFAR and utilised their facilities which were donated in-kind for breeding purposes for a pilot study of the culture of native fish (freshwater perch (Ayungin)), as replacement for non-native Tilapia which is predominantly being stocked in FW bodies. BFAR lent their expertise as external evaluators of the Freshwater Management Effectiveness Assessment Tool (MEAT) meaning this mechanism would have legacy beyond the life of the project.

BFAR Region II leadership allocated budget for the rehabilitation of monitoring outposts constructed as part of the present project that were damaged by Typhoon Ulysses (Internationally known as Typhoon Vamco) in November 2020 (Annex 8).

### **Department of Environment and Natural Resources (DENR)**

DENR provided technical advice on terrestrial assessments, biodiversity conservation and nursery establishment of native trees. They also provided recommendations for management strategies for watershed and riparian areas of the freshwater systems in key project sites. DENR staff were lecturers during law enforcement and para-legal training of river wardens (Annex 7). It also supported sanitation cutting of invasive/alien tree species within freshwater FS (Annex 9). DENR was instrumental in the delivery of bamboo propagation and nursery establishment training to communities in project sites. They actively participated in the Information and Education Campaigns (IEC) in schools and barangays and in tree planting activities (Annex 10). As a partner, DENR provided training to project staff in Biodiversity Assessment and Monitoring Systems and has worked closely in the development of a Watershed Management Plan for Baggao LGU where three of the FS are located. DENR provided office space for the ZSL team for the entire duration of the project.

### **Local Government Units (LGUs)**

In this project, the LGUs have worked collaboratively in solid waste management, eel tagging, riparian assessments, participatory land use planning, and have shared data for disaster risk management. The biggest achievement of the LGUs was the passage of legal ordinances adopting the expansion of FS to include riparian areas, thus establishing an integrated protected area. LGUs in the project sites were instrumental in the adoption of the FS management plans (FSMPs) and providing funds to ensure FS have legacy beyond the project. LGUs were engaged in the appointment of river wardens giving them legal identity as protectors of the environment (Annex 11). The LGUs provided logistical and staff support during the project implementation and were partners in IEC campaigns.

We have also worked with the following organisations on specific elements of the project:

**Cagayan State University (CSU)** - CSU worked with government agencies, private, and non-government organizations (NGOs) to accommodate the university students for on-the-job (OJT) training in environmental projects. Our project was able to train four environmental science students during the first year and six during the second year (Annex 12). Unfortunately, no OJT students were accepted on the third and fourth year of the project life due to the COVID-19 pandemic.

Nueva Vizcaya State University (NVSU) - NVSU provided seeds of native fruiting trees.

Mabuwaya Foundation – an NGO that took the lead in the establishment of an Isabela Oriole sanctuary in the Municipality of Baggao where three of our sanctuaries are located. They are contributory in the reports and updates of freshwater crocodiles found inside the established fish sanctuaries in San Mariano (Buyasan, Disusuan, and Disulap) in the Province of Isabela indicating that the established fish sanctuaries provide refuge and support food for endemic Philippine freshwater crocodiles.

Foundation for Philippine Environment – an NGO that provided relief support to the indigenous peoples and residents of Santa Ana, Gattaran, after the devastating flood that hit the Pinsal Falls Sanctuary, damaging houses and livelihoods.

Department of Agriculture – through their Southern Cagayan Research Centre and Quirino Experimental Station, they provided training on low-impact agriculture, particularly mushroom production using agricultural waste as materials (Annex 13).

LGU Alcala – a flood-prone LGU in the Cagayan Valley Region where no FS has currently been established, was a recipient of native trees reared in our nurseries to be used in their riparian restoration and local greening efforts (Annex 14).

LGBTQ++ Society of Baggao – a local organisation and partner in riparian restoration through planting of indigenous tree species in Duba Fish Sanctuary (Annex 15). They have actively been supporting the local initiative to reforest their municipality through the Baggao Billion Tree Planting Program.

Philippine Army – they have been actively involved in planting of native tree species in our Taglagan Falls FS and Governors Rapids FS sites (Annex 16).

Quarterly meetings of the project Technical Working Group (TWG) were held in order to review and update on the logframe / workplans, schedule of activities, project progress, and roles and responsibilities (see Annex 17).

Beyond the on-going buy-in and collaboration of partners to FS, successful propagation of the native freshwater perch with BFAR is a significant achievement in the step towards reducing the stocking of non-native tilapia in the Philippines. Freshwater perch fingerlings have begun to be dispersed in riverine systems in Northern Luzon and BFAR will be monitoring the success of this pilot venture (Annex 18). Similarly, our work with DENR has meant they now discourage the use of invasive and or introduced tree species in nurseries and planting activities. Indeed, the Department Secretary circulated a memorandum to DENR Regional Offices nationwide to indicate this (Annex 19).

The relationship with some LGUs has, at times, proven challenging. However, through continued engagement with the relevant representatives resulted in a better understanding of how the project will benefit communities and secured the continued support of the LGUs. There were issues at the local level where river warden incentives were sometimes not being met through existing structures – working with LGUs and communities, these have now been included the annual budgets of the former and/or supported by the CoMSCA environmental funds. BFAR will continue to engage with LGUs on these matters once the project has been completed.

### **3 Project Achievements**

#### **3.1 Outputs**

**Output 1.** *Native species protection and sustainable management is measurably improved through increased stakeholder capacity and monitoring efforts and strengthening Freshwater Sanctuaries and management plans.*

Due to their unique life history, we used anguillid eels as a model species to examine the effectiveness of the FS in concert with stakeholder capacity building and technical advisory from ourselves and partner organisations. Tagging and telemetry are well-established techniques to better understand aquatic fauna movement and behaviour, and there are many studies of marine species in the context of protected area effectiveness. However, there are few, if any, examples

of this in the context of freshwater protected areas. As such, this study was a first of its kind in the Philippines. Acoustic telemetry arrays were installed at two FS - Hot Springs and Duba - which represent notably different habitat types. Telemetry methods will allow the movement within and out of the sanctuaries. Additional receivers were strategically positioned at the point where the FS channels join the main Cagayan River and further down the main river as it flows to the sea (Annex 20). A total of 67 giant mottled eels (*Anguilla marmorata*) were tagged and the initial results indicate that they were resident for an average of ~25% of the tracked period (OI 1.2) (Annex 21). Residency and activity patterns varied with habitat type. A significant finding was that typhoon events displaced many individuals, with only 3% returning to FS within the study. Indeed, typhoon activity disrupted the acoustic array in both FS and the main channel of the Cagayan River. We are presently drafting a paper that will be submitted for peer-review later this year.

Tagging studies in the Philippines are not common-place and as such we utilised the experience within ZSL to orientate BFAR personnel in how a range of tagging techniques could be used to better understand the behaviour of aquatic species and provide data to strengthen conservation interventions. A workshop was held and 50 national-level BFAR participants (54% F:46% M) now have an improved understanding of how these techniques can be used (OI 1.1) (Annex 22).

As a result of the collection of tagging data, in concert with the monthly fyke-netting carried out by the FS CMGs, during the project, and increased community capacity, all FS have increased coverage in the past four years (Table 1) – due to the inclusion of the riparian areas (OI 4.2 – see below). In one case, the NTZ was reduced in size. Community members in Aggugaddan, Penablanca, lobbied for more fishing ground in Callao FS and the barangay resolution was reviewed and amended resulting to the decrease in the FS NTZ. However, the SUZ increased in size and with the addition of the RZ this FS is still larger than it was in 2017.

Table 1. Expansion of FS sustainable use (SUZ) and no take zone (NTZ) and establishment of riparian zone (RZ). All areas are in hectares (ha).

Municipality	Barangay	FS	NTZ	SUZ	NTZ	SUZ	RZ	Total FS Area (NTZ + SUZ)	Area	Total Increase
			2017	2017	2021	2021		2021	FS+RZ	
Gattaran	Santa Ana	Pinsal Falls	1.0	0.1	5.0	0.2	4.0	5.2	9.2	8.1
	Tanglagan	Tanglagan Falls	1.2	0.9	2.7	4.3	16.2	7.0	23.2	21.1
Baggao	Pallagao	Blue Water Falls	1.0	1.0	2.4	1.2	12.8	3.6	16.4	14.4
	Asinga-via	Hot Spring	1.0	0.5	2.0	0.7	7.3	2.7	10.0	8.5
	San Miguel	Duba Cave	4.5	1.0	6.8	4.2	10.8	11.0	21.8	16.3
Peñablanca	Agugaddan	Callao	8.8	0.1	5.6	3.9	5.7	9.5	15.2	6.3
	Minanga	Santor	4.0	1.0	7.6	3.3	11.9	10.9	22.8	17.8
San Mariano	Buyasan	Buyasan	1.5	0.5	13.7	1.0	3.5	14.7	18.2	16.2
	Disulap	Disulap	2.8	1.0	11.4	9.9	7.4	21.3	28.7	24.9
	Disusuan	Disusuan	2.8	0.5	9.7	2.4	5.3	12.1	17.4	14.1
Maddela	Divisoria Sur	Governor's Rapids	4.0	2.0	6.7	2.8	5.8	9.5	15.3	9.3
Nagtipunan	Ponggo	Siitan	2.2	1.0	3.5	1.7	5.5	5.2	10.7	7.5
		<b>Total</b>	<b>34.8</b>	<b>9.6</b>	<b>77.1</b>	<b>35.6</b>	<b>96.2</b>	<b>112.7</b>	<b>208.9</b>	<b>164.5</b>

Four out of six FSMPs, were adopted by the LGUs – Gattaran, San Mariano, Maddela and Nagtipunan (Annex 38). We have been working closely with Baggao LGU and the mayor of the municipality – where the remaining FSMP was to be approved. However, political changes and associated challenges within the municipality have meant that this has not been possible. We have been working with BFAR on this process and they will continue to work with Baggao LGU to adopt the FSMP. Regardless, funding to support the Baggao FSMP has still be secured via the Mayor and relevant Municipal Offices. Three workshops were scheduled with Peñablanca

LGU in the past 12 to update and adopt the FSMP, however these have all been cancelled due to COVID. Again, BFAR will work with the LGU when restrictions allow to finalise the FSMP.

Fish Sanctuary Action Teams (FSATs) were formed in nine of the twelve FS (OI 1.3) including a total of 167 stakeholders (F 31%: M 69%). Due to travel restrictions and COVID protocols in the barangays of Minanga, Aggugaddan and Asinga, the remaining three were not able to be established. Again, we have been working closely with BFAR in order that they finalise this process once the project has ended. In the meantime, the FS Management Board (FSMB) that oversee these key sites were responsible for the implementation of the associated FSMP. With the establishment of barangay-level FSATs, there is now more representative engagement of local stakeholders in the implementation of FS management – the FSATs are more effective mechanisms for this with FSMBs being necessary to secure LGU-level funding. These work in concert with the deputised river wardens - 47 were trained throughout the project (2% F: 98% M) (Annex 24) and patrol the FS to ensure compliance with associated ordinances.

Continued monitoring of the effectiveness of the FS was carried out using the Management Effectiveness Assessment Tool (MEAT) adapted specifically for use in freshwater systems (OI 1.4). Training for of 55 FSMB and CMG members, BFAR staff, and river wardens was conducted, (13% F:87% M) and monitoring outposts constructed in the project sites (Annex 25). The third and final freshwater MEAT evaluation workshop was conducted earlier this year. Based on the results of the evaluation, there are four (FSMB/FSMPs and associated FS) that have attained Level 3 – *Sustained in the management of their FS* – while two were considered to be in in Level 2 - *Strengthen the management of their FS*. This has exceeded OI 1.4 of attaining Level 2 for all FS.

**Output 2.** *Data relating to anguillids eels in the Philippines is fed into the national eel management plan and CITES call for international collaboration for improved management of these species.*

The establishment of a national commodity data framework (OI 2.1) has been slow to develop due to it being required to incorporate a range of commodities, and this has been exacerbated by the national restrictions related to COVID. Development began last year by BFAR Central Office but it was not operationalised due to insufficient data being submitted by Regional Offices. Anguillid eel data submitted by CMG to LGUs was provided to BFAR during the development of the National data framework. However, there is a broader, on-going issue at the national level where anguillid eel data is mixed with other species – specifically rice eel. ZSL has been clear with BFAR that this issue is essential to address in order for this mechanism to be effective for both these species. Despite these delays, ZSL are leading on the delivery of a report relating to the Decisions related to eel adopted at CITES CoP 18 - <https://cites.org/eng/taxonomy/term/42080>.

During the past four years, the IUCN Anguillid Eel Specialist Group finalised the assessments of 15 species – this included the three species that are most commonly found in the Philippines, [A. bicolor](#), [A. luzonensis](#) and [A. marmorata](#). Data collected during the project was valuable in informing these assessments (O.I. 2.2).

A draft National Eel Management Plan (NEMP), led by the National eel coordinator – Dr Evelyn Ame, who is a close collaborator on the project – in collaboration with BFAR Central Office has been produced (OI 2.3). However, it has not been able to finalise and adopt this due to COVID travel restrictions and lockdowns in Manila. A planning workshop was scheduled for November 2020 last year to finalise the document, but it was cancelled – this will be rescheduled when COVID restrictions allow. In the interim, BFAR have included some of the strategies of NEMP were integrated into the broader [Comprehensive National Fisheries Industry Development Plan](#) (CNFIDP) which has just been adopted and this will mean progress will be made on eel management in the absence of the species-specific document.

BFAR have engaged with SEAFDEC during the project in the context of regional collaboration around eel management e.g. <https://www.seafdec.id/2019/08/03/3rd-international-symposium-on-the-tropical-eel-genus-anguilla-3rd-istega-2019-its-science-conservation-and-management-for-sustainable-use/>. This engagement has resulted in more co-ordinated efforts, strengthened monitoring and the use of standardised methodologies across species' ranges (OI 2.4).

**Output 3. Human and financial capacity and engagement in managing freshwater resources in 12 focal barangays is increased through social marketing and environment funds delivered by COMSCAs.**

The socio-economic survey was completed in all 12 FS communities which in turn were followed up by feedback and validation sessions (OI 3.1) (Annex 26). A total of 542 respondents in 542 households (55% F: 45% M) were interviewed – the details of which can be seen in Annex 26. But in summary, the majority of respondents farmed as a primary livelihood (63%), and thus were reliant on freshwater resources for irrigation. 44% of respondents indicated they fished in the river, primarily for domestic consumption. A majority of respondents were concerned about money (52%) and food availability (82%), indicating that their livelihoods were not certain.

A total of twenty-three CoMSCAs were established during the life of the project with a total of 520 participants (F 63%: M 37%). The total savings for the twenty-one active CoMSCAs to date (482 beneficiaries – F 66%: M 34%) is PhP equivalent to PhP /person greater than the indicator target of PhP 4,000/person (OI 3.2.). Details of savings groups that have completed at least one cycle can be found in Tables 2 and 3 – note that in 2020, several groups paused savings due to COVID. Loans are primarily being used for education, small enterprises, agribusiness, medical health and to support basic needs and housing improvements. (Annex 27).

Village agent training was conducted – a total of 13 individuals were trained (77% F: 23% M) (Annex 34). We have been able to support the village agents across our sites to establish 11 new CoMSCAs with 241 beneficiaries (70% F: 30% M) – greater than the indicator target of 200 people (OI 3.3).

Environment funds have been established in all CoMSCAs and the cumulative savings of PhP 125,890 (£ 2,098.16) equated to PhP 5,473 / FS / year, greater than the target of 3,600 / FS / year (OI 3.4). Environment funds were used for FS clean up, signage and posters, tree planting and River Warden/CMG allowances, this was in turn bolstered by LGU funds in ten of the sites (OI 3.5. / OI 3.6) (Annex 28). All six LGUs have committed funding to the associated FSMPs / FS during the project, though in one case – Penablanca – this was halted due to COVID in 2020/2021 (OI 3.5). Budget allocation for FS is integrated in the annual investment plan of LGU and assessing actual monies may be challenging. However, available data from several FS indicates that the input ranged from PHP 2 per FS, and thus the mean would likely be equal to, or greater than, the proposed target of / FS / year (OI 3.5).

Table 2. Summary of savers group (SG) share outs in year 2019.

Savers Group	Membership	Savings Fund		Income Generated		
	Yr. 2019	Total Share Out Funds	Mean share out/member	Total Return on Investment	Mean ROI/member	ROI %
Pinsal Falls-Gattaran SG	12					
Pak Paku/Puswak-Gattaran SG	16					
Gov.Rapids Bugadors-Maddela SG	19					
Ponggo-Nagtipunan SG	13					
Brgy.Officials Div.Sur-Maddela SG	22					
Agta-Aguggaddan SG	10					
Aguggaddan-Penablanca SG	15					
Tanglagan Falls-Gattaran SG	18					
Tanglagan HotSpring-Gattaran SG	16					
Bamboo Producers-Asinga Via ES SG	21					
Disulap-SanMariano FS SG	25					
<b>Total</b>	<b>187</b>	<b>1,425,880</b>	<b>7,691</b>	<b>253,047</b>	<b>1,364</b>	<b>16%</b>

Table 3. Summary of savers group (SG) share outs in year 2020.

Savers Group	Membership	Savings Fund		Income Generated		
	Yr. 2020	Total Share Out Funds	Mean Share out/member	Total Return on Investment	Mean ROI /member	ROI %
Pinsal Falls-Gattaran SG	20					
Pak Paku/Puswak-Gattaran SG	19					
Ponggo-Nagtipunan SG	22					
Aguggaddan-Penablanca SG	18					
Tanglagan Falls-Gattaran SG	25					
Tanglagan HotSpring-Gattaran SG	19					
<b>Total</b>	<b>123</b>	<b>1,509,250</b>	<b>73,731</b>	<b>275,993</b>	<b>13,308</b>	<b>19%</b>

**Output 4.** *Land use surrounding 12 FS is assessed and mitigation plans developed and implemented at three priority sites to reduce the impact of terrestrial anthropogenic threats and ensure long-term sustainability of a viable freshwater environment and associated livelihoods within communities.*

From Y2 onwards, we have carried out training of low-impact livelihoods that will benefit communities, as well as rehabilitation efforts and on-going protection of FS. This has been in parallel with the assessment of riparian areas to understand threats, including the impact of invasive species, and identify mitigation opportunities. This dual process has resulted in good progress in delivering Output 4.

A total of 12 riparian assessments and 12 Participatory Land-Use Planning (PLUP) workshops were conducted with 494 participants (F 47%: M 53%) and a total of 34.2 hectares were identified by the participants as needing immediate rehabilitation (OI 4.1) (Annex 29). This led to the identification of priority areas for rehabilitation and areas for low-impact agriculture. Likewise, Disaster Risk Reduction (DRR) mapping was conducted in 12 areas and maps for landslide and flooding were generated (OI 4.7) (Annex 30). In discussion with LGUs it was agreed that it would be more beneficial to include this information into the broader Municipal DRR Management Plan, and as such FSMPs were not amended to include DRR measures. The LGUs will also use this information in the development of their Comprehensive Land-Use Plan, and Forest Land-Use Plan.

Reduced impact livelihood activities and associated trainings were implemented (OI 4.3). To date a total of 62.4 hectares of cornfield have been converted to agroforestry/fruit farm and paku fern farming – over six times greater than the indicator metric (OI 4.3). Additional training in mushroom production using agricultural wastes was due to be carried out but was cancelled due to COVID.

One hundred and thirty-three people (F 46%: M 54%) were trained in nursery establishment and native species silviculture (Annex 31) – this was significantly greater than the target of 30 people. A total of six community nurseries – three was the target (OI 4.4) - were established in Baggao (3), Gattaran (1), Penablanca (1) and Quirino (1) (Annex 31) with a combined production of more than 18,500 native trees during the project life almost double the Y4 target (OI 4.5). The Baggao Billion Trees Greening Project has been the major beneficiary of the produced seedlings, as well as CoMSCA groups, DENR, and private individuals (O.I. 4.6) (Annex 14).

**Output 5.** *The impact of introduced / invasive species on Freshwater Sanctuaries is understood and mitigation is implemented.*

Through the in-river monitoring by the FS CMGs and carrying out riparian assessments of invasive species, we have increased our understanding of the scale of this threat at the 12 sites and identified appropriate mitigation measures. The riparian assessments were completed in all 12 sites – 25% were found to have invasive species (O.I. 5.1) (Annex 32). This informed the development of mitigation activities and also the amendment of FSMPs (OI 5.4) (Annex 33). A ‘sanitisation’ tree cutting permit was issued by DENR and the removal of invasive plant species was carried out inside the Governor’s Rapids Sanctuary in Quirino - a total of eight mature *Gmelina arborea* trees were removed and juvenile invasives were removed from Siitan FS without a permit (OI 5.3). Riparian enhancement / planting using seedlings from nurseries

established during the project was conducted across 11.2 hectares across five FS (Annex 10). In light of these activities, mitigation plans against invasive species were formulated and included in three FSMPs (Annex 22). More broadly than this, IEC materials were posted conspicuously and disseminated in schools and LGUs relating to the invasive species found and the mitigation actions that were taken (Annex 10).

The culture of native fish species was ultimately successful (OI 5.2). Initially, ZSL and BFAR bought a total of 500 adult freshwater perch (Ayungin) from fisherfolks. It was decided to use this species due to the availability of breeders, as they are relatively stress tolerant and rearing is relatively simple. The fish were stocked in tanks and transferred to a rearing pond, where they spawned. A total of 10,000 Ayungin fingerlings were dispersed in the rivers of Tumauni and Cabagan, Isabela (OI 5.2) (see Annex 18) and 5,000 were retained for breeding purposes. This will support the development of BFAR national BASIL Program Fisheries Office Order (FOO) 199 - *Guidelines in the implementation of Balik Sigla sa Ilog at Lawa (BASIL) Program (English translation: Bring Back the Life in Rivers and Lakes)* - which encourages that stocking of invasive tilapia be reduced (Annex 33) – indeed, three LGU has already banned their input in FS through updated FSMPs.

These steps taken forward on the management of invasive species has helped our national partners to begin to address this threat to freshwater systems nationally (Annexes 19 and 33).

### **3.2 Outcome**

The Outcome statement from logframe is as follows: *The biological status, community capacity, resilience and stewardship, and sustainable management of key sites in the Cagayan River Basin are measurably improved to benefit the freshwater ecosystem.*

The Outcome of this project was focussed on building capacity in communities in order to take a holistic approach to freshwater conservation. From the evidence presented in Section 3.1, we believe that there is measurable improvement in the status and management of expanded FS and also in the capacity and resilience of the associated communities to manage natural resources. In addition to this, we believe we have established a number of viable mechanisms to ensure a sustainable legacy for the interventions we have implemented in both communities and FS.

The acoustic tagging of 67 anguillids and the regular monitoring of FS through CMGs and river wardens has improved our understanding of the rivers and by association, our ability to protect them (Outcome Indicator (Ocl 0.1). In turn, this information, as well as our technical support of the communities and FSMBs has informed the expansion of FS (Table 1) and also the updating of FSMPs (Annex 23). The acoustic tagging has yielded >800,000 readings which has presented further evidence to BFAR, DENR and LGUs for the benefits of the FS. In addition to this, as this study was the first of its kind for this species, our understanding of their behaviour has been greatly improved. While both the national eel management plan and fish data framework are still under development by BFAR due to COVID related delays, we have established lines of communication such that monitoring results will be fed from CMG/LGUs to inform both of these higher-level mechanisms such that this information will be amplified from the local level to having wider, National impact. This communication will be supported beyond the end of the project by the CoMSCA environment funds and LGU support for CMG and FS more broadly (Ocl 0.2). These national mechanisms will in turn prove valuable at the regional level through BFAR's on-going work with SEAFDEC.

There are twenty-one active CoMSCAs with a total of 482 beneficiaries across seven barangays and nine FS; this equates to a mean of / person (Ocl 0.3). As such, while we didn't achieve establishment in nine barangays, both the number of beneficiaries and the average savings are greater than the indicator. Thirteen village agents were trained in Y4 (Annex 34), and eleven CoMSCAs with 241 beneficiaries have been established by them – exceeding target indicators.

One of the main aims of the project was to ensure that FS and associated mechanisms were sustainable beyond the end of the project life. We have outlined above how funding is now being directed to FS management through CoMSCA environment funds and LGU monies, and as such believe our interventions will continue to have benefit into the future (Ocl 0.4).

We have built capacity in the use of low impact farming methods and silviculture in order to reduce the impact of riparian activities in/near FS (Ocl 0.5). In addition to this, we carried out a

number of PLUP in order to ensure buy-in of local stakeholders and optimally locate these interventions (Annex 29). To date, 62.4 hectares of farmland has been converted to low-impact activities across five sites – Gattaran (1), Baggao (2), Nagtipunan (1) and Maddela (1).

In addition to these activities, the participatory processes helped to feed into the expansion and modification of FS and the associated development of FSMPs (Annex 23).

Riparian assessments identified areas for rehabilitation and non-native species for removal and 11.2 hectares were rehabilitated using seedlings from our nurseries (Ocl 0.5 / 0.6) (Annex 32). In the water-bodies associated with FS, we have highlighted our progress with identifying native species for stocking and in concert with the production of BFAR FOO 199, the impact of tilapia stocking is expected to reduce in the future.

### **3.3 Monitoring of assumptions**

Assumptions for both the Outcome and Outputs were defined in the context of the logframe and monitored as the project implementation was rolled out. These are summarised below:

#### **Outcome assumptions**

There were a number of basic assumptions made with regard to the stakeholders buying into the projects aims and the benefits of freshwater conservation. As the key sites had rolled over from our previous Darwin-funded project (21-020) we were confident from engagement with communities, LGUs and national partners that we had their continued support. Indeed, after seven years working in the region, support and buy-in for FS and other interventions continues to be strong, typified by all six LGUs willingness to financially support them into the future. Further, the project is delivering other long-term benefits to communities, such as the establishment of CoMSCAs and training of associated village agents, and the establishment of new livelihood options such as native species seedling nurseries. The ability to identify livelihood interventions was another assumption that was monitored.

Assumptions were made relating to novel threats to freshwater systems and also in relation natural disasters. While no major novel threats to freshwater were identified, COVID had a significant effect on the project implementation with delays and cancellations to planned activities affecting progress towards targets – see Section 8. With regard to natural disasters, Typhoon Ompong, Super Typhoon Haima and Typhoon Ulysses made landfall in the region in Y2, Y3 and Y4 of the project, respectively. These caused varying degrees of damage to stakeholders properties – including project staff - and livelihoods, local infrastructure (Annex 8) and limited access to project sites for periods of time. While this did affect project activities, and in some case outputs, we believe that the results of the work will help to reduce the impacts of such natural disasters into the future and DRR data has been shared with LGUs (Annex 30).

With the use of non-native species being carried out across the Philippines we had identified assumptions relating to our project activities focussed on this. While we appreciate our interventions are on a local scale, both the removal of non-native riparian plants and identification for an alternative to tilapia stocking have been successful and look to be adopted beyond the life of the project.

#### **Output Assumptions**

In relation to Output 1, the majority of assumptions related to stakeholder buy-in particularly at the individual FS and associated FSMB level. As stated above, there was good support for the duration for the project and our assumptions held.

There were significant delays to some elements of Output 2 – primarily due to COVID - and as such some of our assumptions did not hold. Both the national data framework and nation eel management plan are still not complete at the time of writing – progress has been made on drafting/establishing them but as evidenced in Section 3.1 there is still work to do to finalise these. BFAR are leading this process and as such it is not reliant on the project for this to be completed and we have also established lines of communications such that relevant data and expertise can be input as needed. Similar delays and barriers have mean that international activities and outputs have been delayed, but again, these are primarily reliant on BFAR and others, and will continue in the absence of the project.

Output 3 was focussed on establishing CoMSCAs and as before there were a number of assumptions made with regard to community buy in which were met, though COVID impacted the ability of the village agents to establish new savings groups. It was assumed that FSMBs would be effective mechanisms for overseeing FS and the associated funding, and this was supported by the willingness of LGUs and CoMSCAs to pass monies to them for support of CMG and river warden activities.

In order for the FS to become a more holistic intervention it was identified that riparian areas should be incorporated and that steps would need to be taken to address certain land practices, again relying on the willingness of stakeholders to adopt these approaches. Annex 23 evidences the incorporation of the riparian area into FS, highlighting the willingness of FSMBs to adopt this approach. For bankside areas to be rehabilitated in a sustainable way, community native species nurseries were established under the assumption there would be appetite for this livelihood intervention and that it would be successful. As evidenced in Section 3.1 thousands of seedlings were grown for the riparian rehabilitation, and even bought by LGUs outside of our focal areas (Annex 10).

Non-native species are often used in livelihood and food security interventions due to their successful establishment, but this can significant impacts on local flora and fauna. As such, it was necessary to assume there was a willingness within relevant government agencies to explore and potentially adopt this new approach. As indicated before both BFAR and DENR have been supportive of these interventions and will inform future efforts using our findings.

#### **3.4 Impact: achievement of positive impact on biodiversity and poverty alleviation**

Impact statement from logframe is as follows: *Freshwater resources in the Philippines are effectively conserved and managed at the community and local government level to secure ecosystem services and contribute to National and International targets.*

ZSL have led the implementation of freshwater in the Philippines over the past seven years. We have evidenced several examples where our work has had influence elsewhere in the country and continue to provide technical expertise to both BFAR and DENR in relation to freshwater conservation and anguillid eel science. The FS model is being considered elsewhere in the Philippines and may be integrated with the BMB protected area network – this was our aim before the end of the project, however, COVID has prevented us from being able to hold the relevant national level meetings.

We have also made good progress in the context of dealing with invasive species. The Philippines National Greening Programme - <https://www.denr.gov.ph/index.php/priority-programs/national-greening-program> - aimed to replant and rehabilitate 1.2M hectares of land by 2022. This has historically also included use of non-native species, but as stated previously, our work on riparian rehabilitation has resulted in a national memo to DENR offices encouraging the use of native species only. The project aligned with the DENR-DA Joint Memorandum Order 2020-02 that adopts the national invasive species strategy and action plan from 2020-2030 as the national framework for the management of invasive alien species (Annex 19).

Similarly, non-native Tilapia stocking is a common practice across the Philippines, instigated by BFAR to improve food security. This species grows and breeds quickly and often dominates over native fauna – as evidenced by our fish surveys (Annex 36). Over the past two years we have been working with BFAR to identify a native species that could begin to replace tilapia and our work culturing freshwater perch has resulted in the first release of this species. BFAR will be continuing to explore this as an alternative as it ties in with the national FOO 199 (Annex 33) to reduce pressures on indigenous fish species in freshwater systems in the Philippines.

The impact of the project has also had international recognition. As stated above, ZSL was invited to speak at the Third ASEAN Conference on Biodiversity in Malaysia, March 2020 (Annex 35). This was recognition of how the project has had impact at the national level and an excellent opportunity to highlight the work to integrate both biodiversity conservation and poverty alleviation at the community level on an international stage. Unfortunately, this was cancelled due to COVID and will not be rescheduled before the project end, but by working with both BFAR and DENR our national government partners will be able to share the successes beyond ZSL's involvement. In addition to this, two members of the team (one UK and one Philippines) visited Nepal in 2019 to share learnings with another Darwin funded ZSL project - *Ghodaghodi's Guardians*:

*Communities restoring a Ramsar wetland at watershed scale (26-012).* We continue to advise on this project remotely and have input to reports, management plans and methodologies.

We continue to engage with global conventions such as CITES at the international level in relation to anguillid eel trade and use, working with the secretariat and multiple government agencies. We attended CoP 18 in 2019 and in light of the Decisions agreed at this meeting - <https://cites.org/eng/taxonomy/term/42080> - we were contracted by the secretariat in 2020 to deliver a report on the use and trade of these species. This will be presented to the Standing Committee in 2022 and the CoP 19 later in the same year.

## **4 Contribution to Darwin Initiative Programme Objectives**

### **4.1 Contribution to Global Goals for Sustainable Development (SDGs)**

The project's overall aim was to protect and sustainably manage areas of the Philippines' largest freshwater system at the community level while reducing anthropogenic impacts. The activities, fundamental to the project, to strengthen FS and build community capacity to reduce impacts on the freshwater resources, captured Sustainable Development Goal targets (SDGt) 1.5, 6.6, 12.2, 12.4, 12.8, 15.1, 15.5 and 15.9. Community management of natural resources (Ocl 0.4 / SDGt 6.B) will remain as a legacy of the project through the FSMBs, FSATs and CMGs and key LGUs (SDGt 16.7). In the earlier part of the project, the completion of socio-economic surveys (OI 3.1) meant the understanding of stakeholder reliance on freshwater systems was improved (SDG 4.7 and 12.8). The establishment of CoMSCAs associated with FS (Ocl 0.3 / OI 3.2/3.3), another legacy of the project, has improved access to financial services that would otherwise be unavailable (SDGt 1.4, 8.10 and 9.3), increasing financial and social security (SDGt 3.8 and 5.4), alleviating poverty (SDGt 1.2) and allowing livelihood diversification. This was further supported through the establishment and on-going support of community-led seedling nurseries, mushroom production and 'garden to table' vegetable farming that aim to minimise harmful input and waste (OI 4.4/4.5 / SDGt 8.3, and 12.5). This also links to the COVID Rapid Response Grant we received (CV19RR16) that focussed on livelihood diversification in FS communities impacted by an absence of tourism.

The inclusion of an environmental fund into CoMSCAs (OI 3.4/3.5) resulted in increased stewardship of natural resources and improved management (SDGt 12.1). Savings for both social and environmental initiatives are outlined in Section 3. CoMSCAs are an established tool in ensuring gender equality and the 21 established in the region during the project have an average membership of 66% female (SDGt 5.5 and 5.7). Our work to expand the FS to include riparian habitat (Ocl 0.5 / OI 4.1/4.2/4.3) ensured land management was both improved and these areas restored e.g. reforestation, (SDGt 2.3, 6.3 and 15.2). This ultimately resulted in habitats becoming more resilient to changing climate and/or natural disasters (SDGt 2.4, 11.5 and 13.1). The focus on reducing impacts of invasive species through the use of native alternatives (Ocl 0.6 / OI 5.1/5.2/5.3/5.4) – both riparian flora and in-river fish stocking - (SDGt 15.8) was aimed at strengthening these ecosystems.

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

This aims and outputs of this project were developed to be deliberately cross-cutting in the context of international policy and the associated national responsibilities, and as such has relevance to CBD, Ramsar, CMS and CITES. The Biodiversity Monitoring Bureau (BMB), which sits within DENR, our project partner, are the national focal point for these four conventions. ZSL had regular engagement with DENR, and also BMB staff, on technical matters, with a bilateral flow of knowledge and expertise.

This project focussed on freshwater systems and so was core to the vision of the 4th Strategic Plan of the Ramsar Convention - "*Wetlands are conserved, wisely used, restored and their benefits are recognized and valued by all*". Further, establishing FS that offer species and habitat protection and benefits the associated communities that rely on these resources, fundamentally addresses Goals 1,3 and 4 of this plan.

As with the SDGs, by establishing FS and building capacity in the communities that manage them, Aichi Targets (AT) relating to habitat loss and restoration, sustainable management and

protection (AT 1, 4, 5, 6, 11, 14 and 18) were captured. Our tagging study to understand the movement of anguillid eels in the context of FS (Ocl 0.1 / OI 1.1/1.2) was novel research and builds the evidence base for how to most effectively implement such interventions (AT 19). The expansion of FS to include riparian habitat (OI 4.1/4.2), including the efforts to restore these where needed and possible, strengthened management of aquatic resources (AT 7). In addition to this there were activities that improved both waste management and improve land-use practices (OI 4.3) to reduce pollution (AT8). The activities focussed on reducing the impact of invasive species (Ocl 0.6 / OI 5.1/5.2/5.3/5.4 / AT 9) and the on-going protection of threatened and/or endemic species in FS (Ocl 0.1 / AT 12) ensured aquatic resources are more resilient. The establishment of CoMSCA environmental funds (OI 3.4) increased stewardship of aquatic resources and improved management, as well as provided leverage for municipal funding (OI 3.5 / AT 2).

At the CITES CoP18, held in 2019 in Geneva, Switzerland, Decisions were adopted, relating to anguillid eels, key species in the CRB (OI 2.1), and Philippines more broadly, and identified in the project as a focal area of work. This document related to all anguillid species when only one - the European eel - is listed in CITES Appendix II. ZSL is presently delivering outputs within these Decisions and attended the virtual CITES Animal and Standing Committee meetings in 2021, and the report we are producing will be presented at the CITES CoP19 in Panama in 2022.

While none of the species found in the Philippines are listed in the CMS Appendices, the tenets of the convention apply to them, and the research carried out as part of our project to better understand the migratory behaviour of anguillid eels, will have relevance. For example, at the CMS CoP13, held in India in February 2020, two resolutions – [‘The role of ecological networks in the conservation of migratory species’](#) and [‘Improving ways of addressing connectivity in the conservation of migratory species’](#) - were updated, both of which have great relevance to the project, and vice versa.

### **4.3 Project support to poverty alleviation**

We established twenty-three CoMSCAs – specific metrics relating to these are presented in Section 3.1 (Ocl 0.3. / OI 3.2.). The establishment of these savings groups increased financial literacy of members, as well as increasing resilience through savings and access to loans. The COVID-19 pandemic added a further threat to rural communities globally and we received reports that CoMSCAs provided members with a buffer to the impact of this. Our newly trained village agents (Ocl 0.3 / OI 3.3) were able to establish new eleven CoMSCAs with 241 beneficiaries (70% F: 30% M). A further positive of the CoMSCAs was that children and teens of participants had begun to save and the concept and practice of savings had trickled down to other family members.

Through the training we offered in low-impact farming and silviculture (Annex 13), we have diversified beneficiaries’ livelihoods, which reduced reliance on a single income and increases resilience to financial shocks (Ocl 0.5. / OI 4.3. / OI 4.4.). This training also included the establishment of basic infrastructure in order to grow certain crops or implement certain methodologies of farming (Annex 13). In some instances, these livelihoods fed into disaster risk reduction e.g. through riparian strengthening / re-establishment from native species planting within FS, thus increasing resilience for all community members (Ocl 0.5. / OI 4.5. / OI 4.6. / OI 4.7.).

In addition to the training described above, we increased the capacity of river wardens – for example, para-legal training was delivered in order they better understand the laws under which they work. The river wardens, CMGs and on-going support of the FS through CoMSCA environment funds and LGU monies will support both human and environmental resilience beyond the life of the project (Ocl 0.4. / OI 3.4 / OI 3.5. / OI 3.6.).

### **4.4 Gender equality**

We aimed to ensure that at a minimum any work we carried out during this project was gender aware/sensitive and delivered through locally appropriate mechanisms. Throughout the document we have outlined the F:M ratio and below we discuss specific cases.

The TWG that guided the projects work included 45% women. Further, we actively engaged with women to join community meetings and consultations, and relevant training. For example, the completed socio-economic surveys resulted in 55% of respondents being female (OI 3.1.).

CoMSCAs have long been identified as a successful mechanism to engage women in decision making and financial management at both the community and household level. CoMSCA membership within the 482 savers 66% were female. As a consequence, women saw direct benefit from increased economic resilience and access to financial services (Ocl 0.3. / OI 3.2.). This was further reflected in the village agent training where 10 (77%) of 13 trainees were female (OI 3.3). By association, the establishment of environment funds linked to CoMSCAs ensured that women play a key role in the disbursement of monies ring-fenced for environmental management (OI 3.4).

At the end of the project, there is a weight towards male participants in the management of FS – 2% and 12% of river wardens and FSMB members are women, respectively, though this is higher in FSATs (31%). These roles were all self-selected indicating this maybe a reflection of social structures.

Training carried out in Y3 in MEAT were conducted and attended by 12 (17%) females (Annex 25) – this was a repeat training saw a 50% increase in female attendance from Y2. Training in nursery establishment and planting (OI 4.4) for native tree and bamboo, saw 44% women attending highlighting opportunities to engage more in FS management through bankside rehabilitation (OI 4.5) and disaster risk reduction (OI 4.7) (Ocl 0.6.).

#### 4.5 Programme indicators

- **Did the project lead to greater representation of local poor people in management structures of biodiversity?**

In light of the results of the socio-economic report (Annex 26) we believe there is involvement of poor/marginalized people and relevant sectoral representation in the FSATs and FSMBs, and the team of river wardens (Annex 37).

- **Were any management plans for biodiversity developed and were these formally accepted?**

Yes. Apart from Baggao, due to political challenges, FSMPs for each LGU were developed and adopted through a municipal resolution (Annex 38) and further adopted for implementation by the barangay through associated ordinances and the FSAT.

- **Were they participatory in nature or were they ‘top-down’? How well represented are the local poor including women, in any proposed management structures?**

The development of these took a participatory approach through on-site planning workshops held in communities associated with FS (Annex 29). The same process was followed in the PLUP and in the Disaster Risk Assessment.

- **How did the project positively influence household (HH) income and how many HHs saw an increase?**

Due to COVID, no post socio-economic survey was able to be conducted to determine impact on household income. However, the establishment of CoMSCAs meant that there was an increase in financial resilience in 132 HH (see Tables 2 and 3).

- **How much did their HH income increase (e.g. x% above baseline, x% above national average)? How was this measured?**

See Tables 2 and 3 for available data on % return on investments for CoMSCA members.

#### 4.6 Transfer of knowledge

The in-country lead was interviewed both on TV and Radio to discuss the importance of freshwater conservation in the region. Further, as stated in previously, the in-country lead was invited to speak at the Third ASEAN Conference on Biodiversity in Malaysia in March 2020,

highlighting that the project is recognised internationally as a pioneering freshwater conservation initiative and that there is opportunity for it to act as a regional case study. This ASEAN meeting was unfortunately cancelled due to COVID-19 but outside of this, the project lead took opportunities to present the work carried out at international conferences and workshops, and fora such as the CMS, the CITES Animals and Standing Committees and the IUCN AESG. Staff from this project have already been advising on another Darwin-funded freshwater initiative in Nepal (26-102).

While there were no formal qualifications that came from the project we did partner with Universities in order to give students work experience. Ten students (F 7: M 3) across two academic years joined our team for 280 hours each. They were involved in various activities including river and riparian assessments, socio-economic surveys, monitoring of FS, native species nursery operations, tree planting, DRR mapping, IEC, PLUP, technical report writing and data analysis (Annex 12). A number of these students were subsequently employed as short-term staff or enumerators after graduating.

#### **4.7 Capacity building**

ZSL's team in the Philippines consisted of four males and two females, and as such representation of our work is done primarily by the former. In addition to the invitation to Malaysia and project visit to Nepal described previously, members of our team were involved in the following initiatives.

BFAR Region 2 formed the Fisheries Management Area (FMA) Science Advisory Group (SAG) in which ZSL were included as the NGO Representative. This group is composed of scientists, and technical experts and project staff were invited to participate in the planning workshop held in Baggao to develop the Pared River Watershed Management Plan. Included in the strategies of the plan are to build on ZSL's work to scale up FS establishment and riverbank restoration using native species. Further, ZSL was invited as the NGO representative during the updating of the five-year BFAR Comprehensive National Fisheries Industry Development Plan (CNFID 2021-2025).

ZSL was invited to be a member of the Regional Wildlife Management Committee (RWMC) chaired by DENR. The role of members is to review wildlife research proposals, relevant wildlife permit applications and respond to reported catching/killing/transporting/selling of wildlife. The RWMC also formulate resolutions and recommend actions pertaining to the protection of wildlife and their habitats.

## **5 Sustainability and Legacy**

As the conservation focus on freshwater systems globally is significantly lacking, this project has continued highlighting the importance of greater conservation attention for inland waters within the Philippines. By partnering with relevant government agencies at the national and local level, it has stimulated activities that will continue in the project's absence. For example, ZSL is recognised as a national expert in the field of freshwater conservation in the Philippines and were invited to attend a workshop to feed our experience into the 6<sup>th</sup> NRCBD.

Further, as stated previously, the lead of our in-country team was invited to speak at the Third ASEAN Conference on Biodiversity in Malaysia in March 2020, highlighting that the project is recognised internationally as a pioneering freshwater conservation initiative and that there is opportunity for it to act as a regional case study. This ASEAN meeting was unfortunately cancelled due to COVID-19 but outside of this, the project lead took opportunities to present the work carried out at international conferences and workshops, and fora such as the CMS, the CITES Animals and Standing Committees and the IUCN AESG. We have explored how it can act as a case study for replication in other countries / locations and staff from this project have already been advising on another Darwin-funded freshwater initiative in Nepal (26-102).

In collaboration with communities and national and local GOs, our aim was to implement a discrete project that will have legacy beyond its tenure. This approach ensured continuity with our previous project (21-020) and buy-in to capacity building activities and policy development that strengthened freshwater conservation initiatives in the long term. By building capacity in FSMBs/FSATs and LGUs we have ensured that the skills are available to manage the freshwater

and terrestrial resources, and their respective FS. The integration of FSMPs into LGU development plans – which include associated budget – has ensured sustainable implementation and management of FS. This integration also provides incentives for river wardens and CMGs who actively patrol and monitor the sanctuaries. As communities and partners have been trained to carry out MEAT evaluations, local stakeholders and LGU staff will be able to evaluate their own sanctuaries together with the BFAR.

More broadly than the individual sites, the information gathered from monitoring and patrolling FS will continue to be shared with partner agencies such as BFAR and DENR, which can help to inform strategies at both the Regional and National levels. For example, BFAR are reviewing existing eel data in other Regions and scheduling exploratory surveys of freshwater systems.

Mitigation actions to reduce the impact of both terrestrial and freshwater invasive species in key sites has been carried out in collaboration with DENR and BFAR who will use these results to inform future strategies. As stated previously, native freshwater perch fingerlings have begun to be dispersed in riverine systems in Northern Luzon (Annex 18) and DENR now discourage the use of invasive and or introduced tree species in nurseries and planting activities (Annex 19).

With regard to the former, the pilot culture of native freshwater fish is in line with BFAR FOO 199 which includes the banning of stocking of invasive species in open water bodies (Annex 33).

While there have been no national policy developments during the project's lifetime we have outlined a number of areas where progress has been made in amending, informing and/or developing new legislation that will benefit freshwater systems and associated stakeholders. The establishment of FS required local level legislative change and these are now legal entities that will exist in the region beyond the life of the project. The supporting management bodies and plans will provide a mechanism to ensure they are sustainably managed by local stakeholders. More broadly, by providing training to local communities to increase their stewardship of natural resources, and represent themselves at the LGU level, the project has ensured that both stakeholders and freshwater ecosystems have increased resilience.

As stated previously, the inclusion of CoMSCAs ensure that there is life beyond the project and by linking this to FS management through the environment fund, the resource protection can also be sustained co-operatively with LGU monies.

While we have developed the next stage of this work, we have at present been unable to secure funding. We believe that our work to date still has value without this next step but are also keen to continue our conservation efforts in the CRB to increase resilience of the system and the associated communities. In the past three months, two of the team have moved to new jobs outside of ZSL and two of the remaining team and relevant resources are being outsourced to other ZSL conservation projects in the interim. Unfortunately, two staff members will be made redundant.

## **6 Lessons learned**

Overall, what has worked well were the partnerships established with national agencies, LGUs, NGOs, state universities and other social and civic organisations working in the field of conservation. This has facilitated delivery but also amplified the work beyond the twelve key sites and increased focus on freshwater conservation in the Philippines. As stated previously, we feel the progress made on the use of non-native species, and moving to using native species, which the project has advocated for is an enormous step forward.

The relationship with some LGUs has, at times, proven challenging. There have been political challenges that are out of our control and that we have had to work around. However, continued engagement with the relevant representatives resulted in a better understanding of how the project will benefit communities and secured the continued support of the LGUs. In future it might be worth considering devolving team members to individual LGUs in order to increase engagement with stakeholders.

We experienced continued issues with anchoring the tag receivers. We knew there would be challenges with maintaining their position, in a region that is so affected by tropical storms. Ultimately, we did lose some infra-structure in bad weather, however, results from the tagging

studies have been invaluable. These are the first studies of their kind in the Philippines and will hugely increase our understanding of the species.

Focussing on specific sites for delivery always has challenges and benefits, from logistics to the scale of impact. We believe that we have genuinely been able to build skills and capacity in our twelve focal sites, recognising, as described elsewhere, that some interventions were more successful than others, and that the success of these has resulted in indirect benefits for biodiversity and people in the region more broadly. CoMSCAs have been particularly timely interventions with several typhoons and COVID-19 impacting communities during the life of the project. The access to savings and loans that CoMSCA membership affords has supported households through these difficult external shocks.

## 6.1 Monitoring and evaluation

The M&E system implemented for this project built on the successes and integrated learnings from our previous Darwin funded project (ref: 21-020). The M&E was led by a dedicated in-country lead and supported by other relevant in-country staff that held specialist knowledge on technical and contextually important components e.g. VSLAs, as well as an international advisor. Despite the delays we faced in early implementation, this set up allowed us to carry out participatory M&E planning within the first few months of the project. This ensured that all project staff fed into the review and finalisation of data collection types, intervals, management and ensured that relevant indicators were captured and finalised against the logframe (see Annex 1) to demonstrate contribution towards the outcome and outputs. This also gave us an opportunity to reflect and review any data collection that had already taken place and set up a clear framework and accountability moving forwards. Appropriate components were also discussed with communities, other experts within the organisation and external partners to ensure maximum practicality and to finalise the approach – this was a key role of the TWG. The participatory and representative nature of this design also ensured that ZSL ably integrated our globally standardised indicators, tools and approaches in combination with those that are contextually relevant and appropriate. This in turn ensured data and learnings could feedback into ZSL, strengthening organisational learnings.

Alongside this, we also implemented regular reporting mechanisms to ensure project management; monthly targets and activities are reviewed and the workplan amended accordingly. TWG meetings were attended quarterly by all project partners, led by ZSL, to ensure implementation was on track and all partners can input technically and administratively. ZSL also had meetings with BFAR, DENR, LGUs, Barangay officials, CoMSCAs and FSMBs on a regular basis in relation to project activities which further ensure we are monitoring progress outside of the structured TWG meetings. This variety of opportunities acted as important feedback mechanisms to partners and stakeholders on the M&E. Regular presence and work with communities meant fluid dialogue on M&E and wherever required, participatory sessions were organised to feedback and validate data collected from our M&E system. This mechanism proved useful for ensuring practical and effective adaptive M&E throughout the project, particularly when dealing with change as exemplified through the community-led fisheries monitoring (see below extract from Y1 report).

*“We have encountered some challenges discussed further in Section 9. To help us to monitor progress we are implementing monthly visits to 3-5 fish sanctuaries to support data collection efforts. Through the community consultations we identified some additional/newer threats to the FS (i.e. removal of riparian vegetation for farming). To ensure we are able to monitor change and impact of project implementation we plan to introduce monitoring of new variables every quarter inside and outside the FS to monitor these.”*

As the M&E plan was finalised against the logframe, the Project Technical Lead created a quarterly workplan based on this with associated indicators and budget. This was shared with the full team and ensured the continuous monitoring of progress against Outputs and Activities towards the Outcome. Targets and activities are reviewed and the workplan amended as needed. Internal evaluations were completed at regular intervals/following set activities, throughout the project against the logframe; this ensured the usability of the findings to inform the approach, celebrate successes and flag potential issues - see Annex 2 for full project achievements. Key

findings and lessons from these evaluations have been reported throughout this report in their related sections. There is ambition for an externally led impact review of this programme to date, however, this has yet to be completed, pending securing continuation funds to resource this programme and team.

Change requests were submitted throughout the project, highlighting the M+E system in place was fit for purpose. This resulted in some changes to targets and activities, but the only major amendment was the extension of the project end date from 31/12/20 to 31/8/21. Due to the impact of COVID on the implementation of activities, our expenditure was lower than expected in FY 20/21. As such, delayed activities were funded into FY 21/22 allowing us to work more closely to our exit strategy and leave a more secure legacy.

## 6.2 Actions taken in response to annual report reviews

We received a number of issues raised as part of our three annual reviews, all of which were shared with project partners. Two issues in the Y3 review were directed to the Final Report and are responded to below:

- *An important step was the finalisation of the socio-economic survey and the generated report. The present report provides the front page and the introduction as evidence; it may be worth adding the full report or an executive summary to the final report.*

The full report can be found in Annex 26.

- *The number of tagged eels at the end will be only sixty-seven. These 67 tagged eels will provide an enormous amount of useful information for further actions. Nevertheless, this number is far from the originally planned number. It would be recommended to explain in the next report why this reduced number is still enough to reach the project goals.*

The target for tagging was 100 eels and the final trip was cancelled due to COVID. While 67 is less than planned, we still received >800,000 data points and this kind of study has never been carried out in the Philippines. As such our understanding of the species and how they move in the context of the FS has been greatly increased.

## 7 Darwin identity

In-country, the Darwin logo sits side-by-side with partner logos on all communications relating to the project. The Darwin logo was used on all materials distributed during IEC activities in schools, training workshops and community meetings, and also during visits to LGU's Mayors and Provincial Governors (see Annex 10, 39 & 40). It has also been included on signage in project sites (Annex 40) which will exist beyond the life of the project. Further, in all consultation meetings or publications, Darwin Initiative is acknowledged as the funder. The Darwin Initiative is introduced to the communities and partners we work with. There is clear communication that the Darwin Initiative is a UK Government grant scheme focussed on biodiversity and the natural environment, often delivered through locally based projects not just in the Philippines but worldwide.

ZSL has had a number of projects funded by Darwin Initiative and so the network of both GO and NGO partners are familiar with them. This project has followed on from previously Darwin-funded work (21-020) and we continue to work in the same region in the present project. As such our focal communities are also familiar with the Darwin Initiative. The project does not form a part of a larger initiative and is a stand-alone programme of work.

A Facebook page - <https://www.facebook.com/freshwaterconservationproject/> - was created that allows the project staff to connect with the communities in the project sites. The posts in Facebook can be shared by the target audience thereby promoting the importance of environmental conservation. This page also acts as a source of information relevant to the project goals and in promoting Darwin Initiative. We do not have a project specific Twitter account, but we do have a general ZSL Marine and Freshwater Twitter account which project updates are posted on (Annex 41).

## 8 Impact of COVID-19 on project delivery

We have outlined a number of activities that have been impacted by COVID throughout the document – the travel restrictions and limits on gatherings have undoubtedly meant certain elements of the project have not been completed. Three visits from the project staff based in the UK cancelled due to international travel restrictions. Training workshops (e.g. CoMSCA), MEAT assessments of FS, and community meetings were delayed and/or cancelled. It has limited FS monitoring and out-planting of native fruit trees due to the imposition of travel restrictions and strict health protocols and were delayed. The formation of three FSATs was postponed due to the fast-changing quarantine regulations and LGUs limiting community meetings to 10 people. Consequently, there have been no TWG meetings since the end of 2019. More generally, a considerable amount of time has been spent securing documents for travel and local public transport is non-operational due to government fears this could potentially be a source of widespread infections. In a number of cases there have been financial implications for project implementations – some CoMSCAs have paused due to members not having funds available to input to savings groups, and both municipal and national level governments have had to divert funds away from supporting elements of work over the past 12-18 months.

In response, where possible and taking into account the limited cellular / data signal of some areas, the majority of communications have been done online. Project staff have responded to local conditions and been based at home when COVID infections are on the rise and the LGU mandates less than 20% capacity in offices. When permitted, meetings are conducted in open-air venues in accordance with the local COVID protocols. To ensure both staff and beneficiaries are safe, facemasks/shields are provided and worn at all times, and hand sanitiser is always available. Further, temperatures of participants are taken, and contact details noted in the event of contact tracing being needed. Project staff are provided with face shields and alcohol. Staff are restricted on travels using public vehicles. In instances where we have not reached our targets e.g. FSAT establishment, where possible, partner organisations have been tasked with finalising activities, when it is safe to do so.

As with many organisations, ZSL is reviewing ways of working in light of COVID. Despite the limitations we have adapted in ways that have allowed project delivery to continue, though as we have outlined this has been compromised at times. The in-country visits by UK staff have definitely been a key element that could not be replaced by other methods. Some of this is due to the technical, field-based nature of the work, and in some cases this is due to limited connectivity in-country.

As previously noted, ZSL were in receipt of a COVID Rapid Response Grant (CV19RR16) that focussed on livelihood diversification in two FS communities, specifically existing CoMSCA members, impacted by an absence of tourism. Initially, the project targeted 64 members from three CoMSCAs but we were able to train 108 beneficiaries from five CoMSCA groups. The project provided immediate financial relief to the beneficiaries through training in qual egg and mushroom production. This resulted in ~PhP 8,690.4 (£5.93) and PhP 3,534.4 (£52.12) per beneficiary from January to March 2021 for mushroom and quail egg production, respectively. Overall, the project increased food production in both municipalities where the intervention was implemented. Additionally, average cumulative savings of the CoMSCA groups increased from PhP 167,020 (£2,784) in January to March '20 to PhP 314,068 (£ 5,234) in January to March '21.

## 9 Finance and administration

### 9.1 Project expenditure

<b>Project spend (indicative) since last annual report</b>	<b>2021/22 Grant (£)</b>	<b>2021/22 Total actual Darwin Costs (£)</b>	<b>Variance %</b>	<b>Comments (please explain significant variances)</b>
Staff costs (see below)				
Consultancy costs				

Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (see below)				
Others (see below)				
<b>TOTAL</b>				

<b>Staff employed (Name and position)</b>	<b>Cost (£)</b>
Alejandro Belen - Project Technical Lead	
Luz Capalungan Assistant Biologist	
Franklin Piad, Jr - Community Organiser	
Reynor Aquino - Assistant Community Organiser	
Mae Ann Rabina - Administrator	
Emma Levy - Projects Administrator	
Surshti Patel - M&E specialist	
Matthew Gollock - Project Lead	
<b>TOTAL</b>	

<b>Capital items – description</b>	<b>Capital items – cost (£)</b>
<b>TOTAL</b>	0

<b>Other items – description</b>	<b>Other items – cost (£)</b>
Repairs, maintenance and fuel	
<b>TOTAL</b>	

## 9.2 Additional funds or in-kind contributions secured

<b>Source of funding for project lifetime</b>	<b>Total (£)</b>
ZSL (Salaries)	
ZSL (Contribution)	
ZSL (Capital equipment)	
DENR (Office-space and utilities)	
<b>TOTAL</b>	

Monies have been secured for the continuation of the FS beyond the life of the project, but they have not been possible to calculate due to LGU budgeting processes.

<b>Source of funding for additional work after project lifetime</b>	<b>Total (£)</b>
<b>TOTAL</b>	0

### **9.3 Value for Money**

As this project followed on from a previous Darwin-funded project (21-020) the ZSL in-country team was well-established. We had built trusted relationships with partners and stakeholders, as evidenced elsewhere in the report, such that we were able to begin delivery quickly, compared to establishing these new. These relationships also meant that there were many examples of in-kind support e.g. free office space with DENR; DENR/BFAR expertise offered for training workshops. We had also a great deal of infrastructure that meant this was not required to be bought new.

More broadly, the project was developed to complement on-going work such as carrying out IUCN Red List Assessments of anguillid eels and engaging on these species in the context of CITES. This presented many opportunities to amplify the work of the project and vice-versa.

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

Note: Insert your full logframe. If your logframe was changed since your Stage 2 application and was approved by a Change Request the newest approved version should be inserted here, otherwise insert the Stage 2 logframe

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p>Impact: Freshwater resources in the Philippines are effectively conserved and managed at the community and local government level to secure ecosystem services and contribute to National and International targets.</p> <p>(Max 30 words)</p>			
<p>Outcome:</p> <p>(Max 30 words)</p> <p>The biological status, community capacity, resilience and stewardship, and sustainable management of key sites in the Cagayan River Basin are measurably improved to benefit the freshwater ecosystem.</p>	<p><b>0.1</b> The protection of native species in 12 FS is increased through strengthened monitoring of 67 tagged fish, updated FS management plans (FSMPs), and an expanded and representative membership of the FSMBs by Q3Y4.</p> <p><b>0.2</b> A national management framework is established to improve data collection and analysis relating to anguillid eels supporting the Philippines in meeting national and international policy and management requirements by Q3Y4.</p> <p><b>0.3</b> Through the establishment of COMSCAs and training of 12 Village Agents (VAs), 400 beneficiaries in 9 barangays have annual savings of at least PHP4,000 / person (~£65) by Q3Y4 (from a baseline of 0 in Y1).</p> <p><b>0.4</b> Community managed FS are self-supporting in 12 barangays through co-funding of at least 7200PHP / FS / year (from a baseline of 0 in</p>	<p>Aquatic survey/monitoring reports and maps;</p> <p>Training reports and materials;</p> <p>Updated management plans;</p> <p>Management Effectiveness Assessment Tool (MEAT) reports</p> <p>Virtual framework;</p> <p>Data collection and analysis reports;</p> <p>National and regional CITES meeting reports;</p> <p>Updated EMP</p> <p>Socio-economic survey report;</p> <p>CoMSCA and VA training reports;</p> <p>CoMSCA agreements;</p> <p>CoMSCA reports</p>	<p>Novel threats to the freshwater environment do not impact the 12 focal sites – having carried out a comprehensive survey of areas identified as FS, we feel confident our interventions address key threats.</p> <p>Natural disaster does not affect project sites – Super Typhoon Haima recently made landfall in our project site and activities relating to 21-020 have continued with little interruption thanks to a committed team and excellent stakeholder relations.</p> <p>Currency rates/rate of inflation does not fluctuate to levels that compromise delivery of the project – we have carried out a robust assessment of historical exchange rates and researched forecasts in light of Brexit and feel confident our budget is robust.</p> <p>The freshwater biome is recognised as valuable by stakeholders and they invest resources accordingly – the</p>

	<p>Y1) by COMSCAs environment fund monies and local and regional GOs by Q3Y4.</p> <p><b>0.5</b> 10ha of bankside habitat is rehabilitated by Q3Y4 through silviculture livelihood diversification and adaptation of freshwater sanctuary management plans (FSMPs) in 12 barangays, reducing impacts on FS and increasing resilience to natural disasters.</p> <p><b>0.6</b> Invasive / exotic species numbers are reduced in both 12 FS and 10ha of associated bankside through improved management and initiatives focussing on native species by Q3Y4 (from the end of surveys carried out by Q1Y2).</p>	<p>CoMSCA agreements;</p> <p>Training reports and materials;</p> <p>Environment fund monies and associated budgets;</p> <p>Freshwater Sanctuary Management Boards (FSMB) report;</p> <p>MoUs between barangays, LGUs and Regional governments</p> <p>Socio-economic survey report;</p> <p>Terrestrial survey reports and maps;</p> <p>Updated Community Land Use Plan (CLUP) and map;</p> <p>Training reports;</p> <p>Farming / nursery records;</p> <p>Amended barangay ordinances;</p> <p>Updated FSMPs</p> <p>Terrestrial and aquatic survey / monitoring reports and maps;</p> <p>Training reports and materials;</p> <p>Amended barangay ordinances</p>	<p>establishment of FS has indicated stakeholder buy-in.</p> <p>Cross-sector stakeholder willingness to engage in project continues - our consultations with stakeholders with regards to the present project have ensured continued buy-in.</p> <p>Communities are not fatigued by any previous efforts to develop interventions – due to the lack of focus on freshwater resources, we believe our interventions are the first of their kind in the region.</p> <p>Identified livelihood options are feasible – we are using interventions that have been successful in other ZSL projects and as such will apply the lessons learned to the proposed work.</p> <p>Mitigation efforts for tilapia are supported by LGUs - our anecdotal research indicates that tilapia are stocked with little assessment of the biological and socio-economic impact; through IEC and biological monitoring we aim to ensure an understanding and dissemination of these in order to intervene in a way that is supported by local communities.</p> <p>Interventions relating to invasive species are successful.</p>
<p>Outputs:</p> <p><b>1. Native species protection and sustainable management is</b></p>	<p>1.1 30 National staff are inducted to the use of tagging techniques in monitoring of aquatic species by Y2Q4. Individual staff members will be trained, as needed, to a self-sufficient level of</p>	<p>Tagging report and peer-reviewed paper.</p>	<p>LGU / Community commitment to FS continues – we believe we have buy-in</p>

<p><b>measurably improved through increased stakeholder capacity and monitoring efforts, and strengthening Freshwater Sanctuaries and management plans.</b></p>	<p>competency in tagging, monitoring and analytical techniques (from a baseline of zero) though mentoring by UK experts by Q3Y4.</p> <p>1.2 67 anguillid eels are tagged (Q4Y1 = 20; Q4Y2= 40; Q4Y3 = 40) and the results of monitoring are used to inform the delineation of 12 existing FS and strengthen associated FSMPs by Q3Y4.</p> <p>1.3 12 barangay-level FS Action Teams (FSATs) are established under the six municipality-level FSMBs to ensure that both river and land-users are represented in management of FS by Q2Y3.</p> <p>1.4 Management Effectiveness Assessment Tool (MEAT) is adapted and applied to FS and Level 2 attained in all 12 by Q3Y4.</p>	<p>Training records and materials</p> <p>Documentation of migration / residence patterns and map of fish</p> <p>Survey report and associated recommendations for FSMB produced.</p> <p>FSAT membership / meeting minutes.</p> <p>Adapted MEAT protocol approved by MPA Support Network (MSN)</p> <p>MEAT report</p>	<p>through on-going community engagement.</p> <p>Tag readers work effectively</p> <p>FSMB approve changes in relation to fish/eel movement and/or presence of native species – our programme of IEC / social marketing aims to increase the understanding of the importance of adaptive management for natural resource protection.</p> <p>FSAT approve expansion of membership.</p> <p>MSN approve adaptation to use in freshwater – ZSL have worked with MSN on previous projects and we have a good relationship with them.</p>
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**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 Tagging orientation training provided

1.2 Tagging, monitoring and analytical techniques training, as needed

1.3 Native fish species – including anguillid eels - are tagged with acoustic tags.

1.4 Movement of native fish species within the Cagayan River Basin is monitored on a micro- and macro- scale.

1.5 Fish movement data and existing FS monthly abundance monitoring data is consolidated and analysed.

1.6 FSMPs are updated in light of consolidated data from FS and fish monitoring.

1.7 FSATs are established to include beneficiaries of new livelihoods e.g. native tree nurseries.

1.8 MEAT assessment adapted for use in FS in consultation with MSN.

1.9 MEAT assessment carried out at all 12 sites.			
<b>2. Data relating to anguillids eels in the Philippines is fed into the national eel management plan and CITES call for international collaboration for improved management of these species.</b>	2.1 National and international co-ordination of data collection is strengthened to meet CITES data call through establishment of national data framework by Q3Y4.	National data framework established	Establishment of framework improves consolidation of national anguillid data – ZSL and the AESG have experience of data collation nationally and internationally and aim to apply this to achieve this output.
	2.2 Understanding of biology and population status of anguillid eels resident in CRB increased by Q3Y4 through analysis of monitoring data from FSMBs by BFAR and AESG.	CITES meeting minutes  Peer reviewed paper	National stakeholders and international range states of anguillid species found in the Philippines are willing to co-operate – through the AESG and BFAR’s links to the South East Asia Fisheries Development Centre (SEAFDEC) we believe there is a strong co-operative network in place.
	2.3 National eel management plan (EMP) is updated through consolidated analysis of data sets by Q3Y4.	Updated EMP	EMP produced as part of project 21-020 is adopted nationally – this is presently being reviewed by stakeholders and was developed through a consultative process which and as such we expect it to be approved nationally early next year.
	2.4 Regional engagement relating to anguillid eels is improved through participation in relevant workshops by Q3Y4.	Workshop minutes	Funding is identified for regional workshops by range states.
<b>Activities</b> (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)			
2.1 National eel data framework established in collaboration with BFAR. 2.2 Key metrics are identified and analysed in line with CITES call. 2.3 Data submitted to AESG for inclusion in Red List assessment workshop. 2.4 Data submitted to national CITES focal point. 2.5 Regional eel focal points in other range states identified and engaged. 2.6 Data relating to eel species used to update EMP			

2.7 Project representatives attend relevant national and international workshops relating to anguillid eels.

<p><b>3. Human and financial capacity and engagement in managing freshwater resources in 12 focal barangays is increased through social marketing and environment funds delivered by COMSCAs.</b></p>	<p>3.1 Needs, cultural and socio-economic assessments carried out in 12 key barangays (including a minimum of 360 respondents) and number of beneficiaries identified and disaggregated by household and gender to identify community understanding of the freshwater ecosystems, the value and use of the freshwater resources and key capacity issues by Q3Y3.</p> <p>3.2 COMSCAs are established in 12 key barangays – encompassing 200 beneficiaries (&gt;50% female) – by Q2Y3 ensuring improved financial security through increased annual savings and access to loans of at least 4000PHP (£65) / person by Q3Y4.</p> <p>3.3 Twelve Village Agents are trained to increase capacity and engagement to establish at least two new COMSCAs per barangay including 200 new beneficiaries (&gt;50% female) across key sites by Q3Y4.</p> <p>3.4 COMSCA environment funds are established in 9 key barangays and an increased willingness of communities to input results in cumulative annual input to environment fund in each barangay rising from PHP0 to at least PHP3600 (£60) per cycle by Q3Y4.</p>	<p>Survey report including recommendations is produced</p> <p>Training and social marketing materials.</p> <p>Twelve CoMSCAs established</p> <p>CoMSCA summaries, loan use and membership data.</p> <p>Twelve CoMSCA Agent trained</p> <p>Village Agent training reports</p> <p>Agents and community organizers exchanges visits/cross visits</p> <p>CoMSCA agreements from communities</p>	<p>Communities participate in surveys.</p> <p>Community buy-in to benefits of CoMSCAs – communities have been requesting the establishment of CoMSCAs since hearing of the success of those established in coastal communities in 21-020.</p> <p>Availability of funds and savings and support of the community.</p> <p>Suitable Village Agents are identified.</p> <p>Village Agents set up new CoMSCAs – once identified, this is a proven method for establishing CoMSCAs.</p> <p>Communities are motivated to support freshwater management and conservation activities – communities were key in identifying FS sites and as such we believe there is buy in to their on-going management.</p> <p>CoMSCAs strengthen FS.</p> <p>CoMSCA members understand benefit of inclusion of the environment fund and there is a willingness to adopt – we</p>
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	<p>3.5 Environment funds are used to leverage monies from LGUs and national agencies for FS to at least match the value of environment funds (PHP3600 (£60) per COMSCA per cycle) by Q4Y3.</p> <p>3.6 Environment funds are being used to support effective enforcement and management activities of FS by end of Q4Y3.</p>	<p>Environment fund records</p> <p>Monies from environment funds and proposed budget for spending in place</p> <p>Memorandum of Agreement support to the Environment Funds and activities program</p> <p>FSMP produced and institutionalised into LGU Annual Investment Plan (AIP).</p> <p>Breakdown of sources of management and enforcement budget</p> <p>CoMSCA summaries</p> <p>Monitoring reports</p> <p>FSMB reports</p>	<p>have developed a social marketing programme to address this issue.</p> <p>Support of LGU's / Barangay Councils, communities, Fisherfolk Association's etc. to long-term development of FS.</p> <p>FS management bodies are transparent and accountable, and effective mechanism for utilising environment funds that gives COMSCAs confidence and trust in handing over environment funds for FS management.</p>
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**Activities**

3.1 Socioeconomic survey is developed, carried out and analysed, and report produced.

3.2 Community feedback sessions held in 12 key barangays.

3.3 Capacity and engagement needs of community and FSMB addressed through series of training courses, social-marketing and infra-structure development.

3.4 COMSCA training is delivered at 12 key barangays.

3.5 Analysis of COMSCA beneficiary financial access and use.

3.6 Village Agents training reinforcing the value of being local champions and their contribution to the management of the FS carried out.

3.7 Village Agent training carried out and new COMSCAs are established.

3.8 Environment funds are established and proposed budget developed and agreed.

3.9 Community and GO co-funding agreement and mechanism of delivery is established for FS enforcement and management.

<p><b>4. Land use surrounding 12 FS is assessed and mitigation plans developed and implemented at three priority sites to reduce the impact of terrestrial anthropogenic threats and ensure long-term sustainability of a viable freshwater environment and associated livelihoods within communities.</b></p>	<p>4.1 Terrestrial areas are assessed and sites for mitigation/improvement are identified in 12 FS through consultation and collaborative land-use mapping by end of Q3Y4.</p> <p>4.2 All FS agreements and FSMPs strengthened through the inclusion of terrestrial areas and associated mitigation activities identified in 4.1 by Q3Y4.</p> <p>4.3 10ha of land-use surrounding FS have reduced impact activities implemented (e.g. conservation agriculture, agro-forestry, erosion control) by Q3Y4 from 0ha in Y1.</p> <p>4.4 At least 30 individuals are engaged in establishing three pilot community nurseries for native tree species.</p> <p>4.5 Three community nurseries have cumulatively produced 2000 seedlings by Q4Y2, 5000 by Q4Y3 and 10000 by Q3Y4.</p>	<p>Minutes of community consultations held to identify suitable areas for reforestation / afforestation and alternative locations for agriculture.</p> <p>ZSL, LGU and community land use mapping surveys carried out.</p> <p>Updated CLUP and map</p> <p>FS ordinances updated and mitigation plan developed</p> <p>Map of updated FS</p> <p>Hectares of reduced impact activities and monitoring report</p> <p>Training methods</p> <p>Nursery record sheets</p>	<p>Community able to self-select areas for improvement and change behaviours and practices relating to terrestrial livelihoods – this process was used to identify FS and we believe it worked well</p> <p>FSMB willing to take on bankside areas to manage.</p> <p>River bank users are willing to participate in improved practice trials – we aim to use IEC and social marketing to engage and increase awareness of stakeholders to the link between healthy riparian areas and healthy freshwater systems.</p> <p>Communities buy-in to nursery development and seedling production.</p> <p>Good availability of native seedlings.</p> <p>Native species grow successfully.</p> <p>There is a market for native species seedlings – the NGP has been extended to 2028 by DENR and we are confident that as a project partner we will have access to this market.</p>
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	<p>4.6 Communities provide seedlings for bankside restoration in FS by Q4Y3.</p> <p>4.7 FSMPs include disaster risk reduction plans with relevant activities e.g. deforestation reversion to prevent siltation/flash floods by Q3Y4.</p>	<p>Value Chain Analysis report</p> <p>Sale of seedlings</p> <p>FSMPs include disaster risk reduction plans</p>	
<p><b>Activities</b></p> <p>4.1 Riparian assessment of 12 FS</p> <p>4.2 Community consultations relating to land use are carried out in 12 key barangays linked to FS.</p> <p>4.3 Behaviour change programme related to responsible farming practices and mitigation of threats established.</p> <p>4.4 Participatory land-use mapping carried out in the areas around the 12 FS.</p> <p>4.5 Consolidation and analysis of data for each of the 12 sites is carried out to identify priority areas for mitigation.</p> <p>4.6 Twelve FS agreements and FSMPs amended to include identified riparian areas and associated mitigation actions</p> <p>4.7 Prioritisation of terrestrial mitigation to identify three implementation sites.</p> <p>4.8 Training in reduced impact land-use activities delivered at three priority sites.</p> <p>4.9 Participatory implementation of reduced impact land-use livelihoods at three priority sites.</p> <p>4.10 Monitoring of mitigation activities to assess effectiveness.</p> <p>4.11 Value Chain Analysis for native species seedlings.</p> <p>4.12 Community training in silviculture and nursery establishment delivered in three sites.</p> <p>4.13 Native seed planting and cultivation.</p> <p>4.14 Seedlings sold into market – including local mitigation activities and NGP.</p> <p>4.15 Disaster risk reduction plans developed and included in FSMPs.</p>			
<p><b>5. The impact of introduced / invasive species on Freshwater Sanctuaries is understood and mitigation is implemented.</b></p>	<p>5.1 Terrestrial and aquatic exotic / invasive species in all FS are catalogued and/or mapped and impact assessment carried out by Q4Y3.</p> <p>5.2 In collaboration with BFAR and LGUs, invasive freshwater species mitigation feasibility</p>	<p>Survey report and maps</p>	<p>There is government support for invasive species mitigation.</p> <p>Appropriate native species are available.</p>

	<p>study (including native species culture) is initiated by Q2Y3.</p> <p>5.3 10ha of bankside is cleared of exotic/invasive species (from 0ha in Y1) and rehabilitated using native species seedlings from community nurseries (4.4) by Q3Y4.</p> <p>5.4 Management of invasive species is included in FS ordinances by Q3Y4.</p>	<p>Monitoring reports</p> <p>Training records / farm log sheets</p> <p>Planting records</p> <p>Map of rehabilitated areas</p> <p>Amended FS ordinance</p>	
<p><b>Activities</b></p> <p>5.1 Invasive species survey carried out in 12 FS.</p> <p>5.2 FSMPs adapted to incorporate mitigation activities.</p> <p>5.3 Native freshwater fish species pilot culture programme initiated.</p> <p>5.4 Feasibility study produced.</p> <p>5.5 Areas of non-native riparian species identified and cleared.</p> <p>5.6 Native species seedlings transplanted from nurseries.</p> <p>5.7 FS barangay ordinances adapted to incorporate invasive species mitigation.</p>			

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

Project summary	Measurable Indicators	Progress and Achievements
<p><b>Impact</b></p> <p>Freshwater resources in the Philippines are effectively conserved and managed at the community and local government level to secure ecosystem services and contribute to National and International targets.</p>		<p>Throughout the project we have shared learnings and data through international mechanisms such as ASEAN, SEAFDEC, IUCN and CITES. Further, two of the team carried out a successful knowledge sharing visit to a Darwin-funded project in Nepal lead by ZSL. We continue to advise as this is implemented on elements relating to building community capacity and stewardship, and how this links to poverty alleviation.</p> <p>Working with national partners we have made progress on addressing the impacts of aquatic and riparian invasive species which will guide interventions beyond the life of the project.</p>
<p><b>Outcome</b></p> <p>The biological status, community capacity, resilience and stewardship, and sustainable management of key sites in the Cagayan River Basin are measurably improved to benefit the freshwater ecosystem.</p>	<p><b>0.1</b> The protection of native species in 12 FS is increased through strengthened monitoring of 67 tagged fish, updated FS management plans (FSMPs), and an expanded and representative membership of the FSMBs by Q3Y4.</p> <p><b>0.2</b> A national management framework is established by to improve data collection and analysis relating to anguillid eels supporting the Philippines in meeting national and international policy and management requirements by Q3Y4.</p> <p><b>0.3</b> Through the establishment of COMSCAs and training of 12 Village Agents (VAs), 400 beneficiaries in 9 barangays have annual savings of at least PHP4,000 / person (~£65) by Q3Y4 (from a baseline of 0 in Y1).</p> <p><b>0.4</b> Community managed FS are self-supporting in 12 barangays through co-funding of at least 7200PHP / FS / year (from a baseline of 0 in Y1) by COMSCAs environment fund monies and local and regional GOs by Q3Y4.</p>	<p>In total, 67 tagged eels have yielded &gt;800,000 data points across and nine acoustic receivers. Four FSMPs have been updated and all FSMBs have been expanded to include landowners now that FS are including riparian areas.</p> <p>National data system for all fish commodities is being progressed by BFAR Central Office – anguillid-specific input being provided by Dr Evelyn Ame. However there have been delays due to COVID and associated budget. BFAR in collaboration with SEAFDEC have been gathering eel fisheries dependent data across the Philippines.</p> <p>Twenty one active CoMSCAs have been established including 482 beneficiaries (F 66%: M 34%). Thirteen village agents have been trained (77% F: 23% M) who have in turn established a total of 11 savers groups in their respective barangays. A total savings of PhP 2,526428.00, equivalent to PhP 5,283/person was attained.</p> <p>Environment funds and/or LGU support are in place in 10 of 12 FS.</p> <p>LGU monies are not always public knowledge due to being included in</p>

Project summary	Measurable Indicators	Progress and Achievements
	<p><b>0.5</b> 10ha of bankside habitat is rehabilitated by Q3Y4 through silviculture livelihood diversification and adaptation of freshwater sanctuary management plans (FSMPs) in 12 barangays, reducing impacts on FS and increasing resilience to natural disasters.</p> <p><b>0.6</b> Invasive / exotic species numbers are reduced in both 12 FS and 10ha of associated bankside through improved management and initiatives focussing on native species by Q3Y4 (from the end of surveys carried out by Q1Y2).</p>	<p>annual investment plans. However, we believe that due to the EF being PhP 5,473 / FS / year we have achieved this target.</p> <p>11.2 hectares of bankside were rehabilitated and planted with native trees. Six nurseries for native trees, fruit trees, bamboo were established and produced &gt;18,500 seedlings. Seedlings were sold by DENR, LGU and CoMSCA. 62.4 hectares of low impact agriculture established in selected five sites.</p> <p>11.2 hectares of riparian area was rehabilitated with native species. A total of 10,000 cultured Ayungin fingerlings were released into rivers as an alternative to tilapia. Native species silviculture and fish culture initiated during the project will continue beyond its life.</p>
<p><b>Output 1. Native species protection and sustainable management is measurably improved through increased stakeholder capacity and monitoring efforts and strengthening Freshwater Sanctuaries and management plans.</b></p>	<p>1.1 30 National staff are inducted to the use of tagging techniques in monitoring of aquatic species by Y2Q4. Individual staff members will be trained, as needed, to a self-sufficient level of competency in tagging, monitoring and analytical techniques (from a baseline of zero) through mentoring by UK experts by Q3Y4.</p> <p>1.2 67 anguillid eels are tagged (Q4Y1 = 20; Q4Y2= 40; Q4Y3 = 40) and the results of monitoring are used to inform the delineation of 12 existing FS and strengthen associated FSMPs by Q3Y4.</p> <p>1.3 12 barangay-level FS Action Teams (FSATs) are established under the six municipality-level FSMBs to ensure that both river and land-users are represented in management of FS by Q2Y3.</p>	<p>Fish tagging orientation conducted and attended by 50 BFAR staff (54% F:46% M) from across the Philippines (Annex 22).</p> <p>67 eels acoustically tagged and released inside two (Annex 21) FS. Nine receivers were deployed and &gt;800,000 data points were collected. This data, as well as that collected by the CMGs and expansion into the riparian area has meant four out of six FSMPs (Annex 23) have been updated and implemented by FSMBs. The updating of the final FSMPs will be progressed by BFAR in collaboration with Baggao and Penablanca LGUs.</p> <p>Due to COVID related restrictions, only nine of twelve FSATs were formed in support of implementation of FSMPs at the FS-level (Annex 42). Representation on these has taken into account the expanded riparian area of the FS – including a</p>

Project summary	Measurable Indicators	Progress and Achievements
	1.4 Management Effectiveness Assessment Tool (MEAT) is adapted and applied to FS and Level 2 attained in all 12 by Q3Y4.	Riparian Committee. BFAR will work with communities and LGUs to establish the final three FSATs.  MEAT training of 55 FSMB and CMG members, BFAR staff, and river wardens was conducted, (13% F: 87% M) and monitoring outposts constructed in the project sites (Annex 25). Based on the results of three years of evaluation, there are four FSMB/FSMPs and associated FS that have attained Level 3 while two were considered to be in in Level 2 exceeding the target.
Activity 1.1 Tagging orientation training provided		Workshop held in October 2018.
Activity 1.2 Tagging, monitoring and analytical techniques training, as needed		No requests for specific training were received from trainees.
Activity 1.3 Native fish species – including anguillid eels - are tagged with acoustic tags.		67 eels were acoustically tagged and released back in the wild.
Activity 1.4 Movement of native fish species within the Cagayan River Basin is monitored on a micro- and macro- scale.		>800,000 data points were collected across the array of nine receivers.
Activity 1.5 Fish movement data and existing FS monthly abundance monitoring data is consolidated and analysed.		Relevant data from CMGs was processed and submitted to LGUs and BFAR.
Activity 1.6 FSMPs are updated in light of consolidated data from FS and fish monitoring.		Four out of six FSMP updated; two were not updated due to travel restrictions and lockdowns.
Activity 1.7 FSATs are established to include beneficiaries of new livelihoods e.g. native tree nurseries.		Nine FSATs were established to implement the FSMP at the FS level. Its structure included a Riparian Committee.
Activity 1.8 MEAT assessment adapted for use in FS in consultation with MSN.		Freshwater MEAT has been introduced as standard tool in evaluating locally managed freshwater sanctuaries.
Activity 1.9 MEAT assessment carried out at all 12 sites.		Three MEAT workshops were conducted to evaluate the twelve FS.
<b>Output 2.</b> Data relating to anguillids eels in the Philippines is fed into the national eel management plan and CITES call for international collaboration for improved management of these species.	2.1 National and international co-ordination of data collection is strengthened to meet CITES data call through establishment of national data framework by Q4Y2.  2.2 Understanding of biology and population status of anguillid eels resident in CRB increased by Q3Y4 through analysis of monitoring data from FSMBs by BFAR and AESG.	Development began on a data framework last year by BFAR Central Office but COVID has slowed progress. Anguillid eel data submitted by CMG to LGUs was provided to BFAR during the development of the framework. Despite these delays, ZSL are leading on the delivery of a report relating to the Decisions related to eel adopted at CITES CoP 18 - <a href="https://cites.org/eng/taxonomy/term/42080">https://cites.org/eng/taxonomy/term/42080</a> .  The IUCN AESG finalised the assessments the three species that are most commonly found in the Philippines, <i>A. bicolor</i> , <i>A. luzonensis</i> and <i>A. marmorata</i> . Data collected during the project was valuable in informing these assessments.

Project summary	Measurable Indicators	Progress and Achievements
	<p>2.3 National eel management plan (EMP) is updated through consolidated analysis of data sets by Q3Y4.</p> <p>2.4 Regional engagement relating to anguillid eels is improved through participation in CITES workshops by Q3Y4.</p>	<p>A draft National Eel Management Plan (NEMP) has been produced. However, it has not been able to finalise and adopt this due to COVID travel restrictions and lockdowns in Manila. In the interim, BFAR have included some elements of NEMP into the broader Comprehensive National Fisheries Industry Development Plan (CNFIDP) meaning progress will be made on eel management in the absence of the species-specific document (Annex 43).</p> <p>BFAR have engaged with SEAFDEC during the project in the context of regional collaboration around eel management e.g. <a href="https://www.seafdec.id/2019/08/03/3rd-international-symposium-on-the-tropical-eel-genus-anguilla-3rd-istega-2019-its-science-conservation-and-management-for-sustainable-use/">https://www.seafdec.id/2019/08/03/3rd-international-symposium-on-the-tropical-eel-genus-anguilla-3rd-istega-2019-its-science-conservation-and-management-for-sustainable-use/</a>. This engagement has resulted in more co-ordinated efforts, strengthened monitoring and the use of standardised methodologies across species' ranges.</p>
Activity 2. 1. National eel data framework established in collaboration with BFAR.		Eel data is being incorporated into a broader commodity database – this has been established but roll-out has been limited due to COVID.
Activity 2.2. Key metrics are identified and analysed in line with CITES call.		Metrics for eel species were regionally identified through SEAFDEC and BFAR engaged in this process.
Activity 2.3 Data submitted to AESG for inclusion in Red List assessment workshop.		Data submitted to AESG workshop in November 2018 and assessments published in 2019.
Activity 2.4 Data submitted to national CITES focal point.		Data was submitted to national focal point in line with a call by CITES in 2018. ZSL are leading delivery of a follow-up report relating to eels to CITES, due in 2021.
Activity 2.5 Regional eel focal points in other range states identified and engaged		SEAFDEC continue support of fisheries dependent glass eel data monitoring in the CRB in collaboration with BFAR.
Activity 2.6 Data relating to eel species used to update EMP		Data related to anguillids species were submitted to BFAR on an on-going basis.
Activity 2.7 Project representatives attend national and international CITES workshops relating to anguillid eels.		Project Lead travelled to Japan to attend regional workshop on status of Japanese eel. Project Technical Lead invited to speak at ASEAN conference. Both were postponed due to COVID-19. The Project lead attending CITES CoP18, and Animals and Standing Committees.
<b>Output 3.</b> Human and financial capacity and engagement in managing freshwater resources in 12	3.1 Needs, cultural and socio-economic assessments carried out in 12 key barangays (including a minimum of 360 respondents) and number of beneficiaries identified and disaggregated by household and	The socio-economic survey of the 12 key sites was completed with a total of 542 respondents and 542 household (Annex 26). A report was produced and submitted for use in updating FSMPs and demographic profiling to key LGUs.

Project summary	Measurable Indicators	Progress and Achievements
<p>focal barangays is increased through social marketing and environment funds delivered by COMSCAs</p>	<p>gender to identify community understanding of the freshwater ecosystems, the value and use of the freshwater resources and key capacity issues by Q4Y1.</p> <p>3.2 COMSCAs are established in 12 key barangays – encompassing 200 beneficiaries (&gt;50% female) – by Q2Y2 ensuring improved financial security through increased annual savings and access to loans of at least 4000PHP (£65) / person by Q3Y4.</p> <p>3.3 Twelve Village Agents are trained to increase capacity and engagement to establish at least two new COMSCAs per barangay including 200 new beneficiaries (&gt;50% female) across key sites by Q3Y4.</p> <p>3.4 COMSCA environment funds are established in 9 key barangays and an increased willingness of communities to input results in cumulative annual input to environment fund in each barangay rising from PHP0 to at least PHP3600 (£60) per cycle by Q3Y4.</p> <p>3.5 Environment funds are used to leverage monies from LGUs and national agencies for FS to at least match the value of environment funds (PHP3600 (£60) per COMSCA per cycle) by Q4Y3.</p> <p>3.6 Environment funds are being used to support effective enforcement and management activities of FS by end of Q4Y2.</p>	<p>Twenty one active CoMSCAs have been established including 482 beneficiaries (F 66%: M 34%) with a total of savings of PhP 2,546,480 (£42,441) equivalent to PhP 5,283/person (Annex 27).</p> <p>Thirteen village agents have been trained (Annex 34) (77% F: 23% M) who have in turn established a total of 11 savers groups including 241 beneficiaries (70% F: 30% M) in their respective barangays.</p> <p>A total of EF for the project duration is PHP 125,890 EF generated by the 21 active savers group across seven barangays (Annex 28). This equates to PhP 5,473 / FS / year.</p> <p>All six LGUs have committed funding to the associated ten FS (Annex ??). Budget allocation for FS is integrated in the annual investment plan of LGU and assessing actual monies may be challenging. Available data from several FS indicates that the input ranged from PHP 2,500 to 10,000 per FS, and thus the mean would likely be equal to or greater than the proposed target of 3,600 / FS / year.</p>

Project summary	Measurable Indicators	Progress and Achievements
		Environment funds generated by each group were purposely used to support the management of respective FS. i.e incentive of river warden, installation of no fishing and waste management placards/signages in fish sanctuaries and buying bamboo seedlings and planted along the riverbanks (Annex 27).
Activity 3.1 Socioeconomic survey is developed, carried out and analysed, and report produced.		Survey carried out in 12 key sites with total of 542 individuals from 542 households interviewed (55% F: 45% M).
Activity 3.2 Community feedback sessions held in 12 key barangays.		Results of surveys have been presented to the twelve communities in feedback sessions.
Activity 3.3 Capacity and engagement needs of community and FSMB addressed through series of training courses, social-marketing and infra-structure development.		Training was provided to community members in silviculture, low-impact agriculture, mushroom farming, and those that became river wardens received courses in law-enforcement and para-legal studies.
Activity 3.4 COMSCA training is delivered at 12 key barangays.		11 CoMSCA training/orientation workshops were conducted in 12 key sites with 520 total participants (F 63%: M 37%)
Activity 3.5 Analysis of COMSCA beneficiary financial access and use.		Loans are primarily being used for education, small enterprises, agribusiness, medical health and to support basic needs and housing improvements.
Activity 3.6 Village Agents training reinforcing the value of being local champions and their contribution to the management of the FS carried out.		Two village agent training sessions were conducted with 13 existing CoMSCA representatives (77% F: 23% M) attending.
Activity 3.7 Village Agent training carried out and new COMSCAs are established.		Trained village agents supported the establishment of 11 new savers groups of 241 beneficiaries (70% F: 30% M).
Activity 3.8 Environment funds are established, and proposed budget developed and agreed.		A total of PHP 125,890 (£ 2,098.16) was generated from the environment funds of the 21 active CoMSCAs.
Activity 3.9 Community and GO co-funding agreement and mechanism of delivery is established for FS enforcement and management.		CoMSCA environment funds and LGU funds have been secured to support the incentives given to river wardens for enforcement of FS and CMG monitoring.
<p><b>Output 4.</b></p> <p>Land use surrounding 12 FS is assessed and mitigation plans developed and implemented at three priority sites to reduce the impact of terrestrial anthropogenic threats and ensure long-term sustainability of a viable freshwater environment and</p>	<p>4.1 Terrestrial areas for mitigation/improvement are identified in 12 FS through consultation and collaborative land-use mapping by end of Q1Y2.</p> <p>4.2 All FS agreements and FSMPs strengthened through the inclusion of terrestrial areas and associated mitigation activities identified in 4.1 by Q2Y2.</p>	<p>34.2 hectares of riparian areas for rehabilitation identified through the conduct of PLUP workshops. Land-use maps of the 12 key sites produced and report submitted (Annex 29).</p> <p>FSMPs were updated to include riparian areas, including location specific issues relating to invasive species (Annex 23).</p> <p>Pilot low impact agriculture practices were established and planted with native trees and fern in 62.4 ha (Annex 13).</p>

Project summary	Measurable Indicators	Progress and Achievements
associated livelihoods within communities.	<p>4.3 10ha of bankside have reduced impact activities implemented (e.g. conservation agriculture, agro-forestry, erosion control) by Q3Y4 from 0ha in Y1.</p> <p>4.4 At least 30 individuals are engaged in establishing three pilot community nurseries for native tree species.</p> <p>4.5 Three community nurseries have cumulatively produced 2000 seedlings by Q4Y2, 5000 by Q4Y3 and 10000 by Q3Y4.</p> <p>4.6 Communities provide seedlings for bankside restoration in FS by Q4Y3.</p> <p>4.7 FSMPs include disaster risk reduction plans with relevant activities e.g. deforestation reversion to prevent siltation/flash floods by Q3Y4.</p>	<p>Six nurseries of native trees, fruit trees and bamboo were established to support rehabilitation (Annex 31).</p> <p>133 beneficiaries (F 44%: M 56%) were trained across six nurseries (Annex 31).</p> <p>18,500 seedlings of fruit bearing trees, native trees and bamboo were cumulatively produced in the community nurseries (Annex 31).</p> <p>Seedlings produced in nurseries were used for tree planting along riverbanks by Baggao, Maddela, Nagtipunan, Gattaran, Penablanca, and Alcala LGUs, as well as DENR Regional Office (Annex 10).</p> <p>Flood and erosion maps produced and submitted to partner LGUs for inclusion in their Disaster Risk Reduction Management (DRRM) Plan (Annex 30).</p>
Activity 4.1 Riparian assessment of 12 FS		Riparian assessment of the 12 key sites were carried out.
Activity 4.2 Community consultations relating to land use are carried out in 12 key barangays linked to FS.		A series of consultations with the landowners around key sites were conducted.
Activity 4.3 Behaviour change programme related to responsible farming practices and mitigation of threats established.		Low impact agriculture - Sustainable Corn Production in Sloping Areas (SCOPSA), and organic farming - was introduced to the land-owners along the river banks in five FS.
Activity 4.4 Participatory land-use mapping carried out in the areas around the 12 FS.		Participatory land-use planning workshop conducted in 12 key sites, and maps prepared.
Activity 4.5 Consolidation and analysis of data for each of the 12 sites is carried out to identify priority areas for mitigation.		Low impact agriculture areas identified, and rehabilitation areas planted with native tree seedlings.
Activity 4.6 Twelve FS agreements and FSMPs amended to include identified riparian areas and associated mitigation actions		FS ordinance amended and FSMP updated to include the riparian areas both sides of the NTZ and SUZs.

Project summary	Measurable Indicators	Progress and Achievements
Activity 4.7 Prioritisation of terrestrial mitigation to identify three implementation sites.		Five prioritised areas identified – Gattaran (1), Baggao (2), Nagtipunan (1) and Maddela (1).
Activity 4.8 Training in reduced impact land-use activities delivered at three priority sites.		Training in planting of native fruit-bearing trees delivered.
Activity 4.9 Participatory implementation of reduced impact land-use livelihoods at three priority sites.		62.4 hectares of reduced impact agriculture was established through the planting of native fruit-bearing trees.
Activity 4.10 Monitoring of mitigation activities to assess effectiveness.		Monthly monitoring of planted trees was carried out with the LGU technician to assess growth and survival.
Activity 4.11 Value Chain Analysis for native species seedlings.		Value chain analysis prepared and submitted for native trees seedlings (Annex 44).
Activity 4.12 Community training in silviculture and nursery establishment delivered in three sites.		One hundred and thirty-three people (F 44%: M 56%) were trained in nursery establishment and native species silviculture. Six community nurseries were established in Baggao (3), Gattaran (1), Penablanca (1) and Quirino (1).
Activity 4.13 Native seedling planting and cultivation.		18,500 seeds and bamboo node planted across six nurseries.
Activity 4.14 Seedlings sold into market – including local mitigation activities and NGP.		>1,200 seedling and bamboo sold to DENR, LGU and CoMSCA to date.
Activity 4.15 Disaster risk reduction plans developed and included in FSMPs.		Submitted produced DRRM maps to LGUs for inclusion in Municipal DRRM plan.
<p><b>Output 5.</b> The impact of introduced / invasive species on Freshwater Sanctuaries is understood and mitigation is implemented.</p>	<p>5.1 Terrestrial and aquatic exotic / invasive species in all FS are catalogued and/or mapped and impact assessment carried out by Q4Y3.</p> <p>5.2 In collaboration with BFAR and LGUs, invasive freshwater species mitigation feasibility study (including native species culture) is initiated by Q2Y3.</p> <p>5.3 10ha of bankside is cleared of exotic/invasive species (from 0ha in Y1) and rehabilitated using native species seedlings from community nurseries (4.4) by Q3Y4.</p> <p>5.4 Management of invasive species is included in FS ordinances by Q3Y4.</p>	<p>Invasive species (trees and fishes) were identified as a result of the riparian assessment and invasive fish species survey conducted (Annex 32).</p> <p>A native fish species pilot hatchery was established in partnership with BFAR. The initial adult stocks of Ayungin produced ~15,000 fingerlings. 10,000 of these were dispersed in Cagayan River by BFAR to replace tilapia (Annex 18).</p> <p>Invasive trees were inventoried by DENR before 11.2 hectares were rehabilitated using seedlings from community nurseries (Annex 10).</p>

Project summary	Measurable Indicators	Progress and Achievements
		Mitigation strategies to eliminate and/or control the invasive fish species were included in the updated FSMP of three FSMBs (Annex 23).
Activity 5.1 Invasive species survey carried out in 12 FS.		Report prepared and shared with BFAR.
Activity 5.2 FSMPs adapted to incorporate mitigation activities.		Resolution formulated by legislative bodies of LGUs for the adaption and implementation of the four updated FSMP.
Activity 5.3 Native freshwater fish species pilot culture programme initiated.		15,000 Ayungin fingerlings produced in the established pilot hatchery.
Activity 5.4 Feasibility study produced.		Scientific report on pilot hatchery of freshwater fishes produced and submitted to BFAR.
Activity 5.5 Areas of non-native riparian species identified and cleared.		A total of eight Gmelina trees in Governors Rapid were cut down with approved permit.
Activity 5.6 Native species seedlings transplanted from nurseries.		Fourteen native species planted in areas identified for rehabilitation.
Activity 5.7 FS barangay ordinances adapted to incorporate invasive species mitigation.		Resolutions from twelve key barangays and municipal ordinance adapted.

## Annex 3 Standard Measures

Code	Description	Total	Nationality	Gender	Title or Focus	Language	Comments
<b>Training Measures</b>							
1a	Number of people to submit PhD thesis						
1b	Number of PhD qualifications obtained						
2	Number of Masters qualifications obtained						
3	Number of other qualifications obtained						
4a	Number of undergraduate students receiving training	10	Filipino	M = 3 F = 7	On-the-Job Training	Filipino / English / Ilokano	
4b	Number of training weeks provided to undergraduate students	70 weeks = 280 hours per student x 10					
4c	Number of postgraduate students receiving training (not 1-3 above)						
4d	Number of training weeks for postgraduate students						
5	Number of people receiving other forms of long-term (>1yr) training not leading to formal qualification (e.g., not categories 1-4 above)						
6a	Number of people receiving other forms of short-term education/training (e.g., not categories 1-5 above)	See below.					
6b	Number of training weeks not leading to formal qualification						
7	Number of types of training materials produced for use by host country(s) (describe training materials)	5				English	CoMSCA; Native Tree Nursery Establishment;

							Paralegal; 2 x Bamboo Production
Research Measures		Total	Nationality	Gender	Title	Language	Comments/ Weblink if available
9	Number of species/habitat management plans (or action plans) produced for Governments, public authorities or other implementing agencies in the host country (ies)	6	Philippines		FSMPs	English	Participatory process? Yes
10	Number of formal documents produced to assist work related to species identification, classification and recording.						
11a	Number of papers published or accepted for publication in peer reviewed journals						
11b	Number of papers published or accepted for publication elsewhere						
12a	Number of computer-based databases established (containing species/generic information) and handed over to host country						
12b	Number of computer-based databases enhanced (containing species/genetic information) and handed over to host country						
13a	Number of species reference collections established and handed over to host country(s)						
13b	Number of species reference collections enhanced and handed over to host country(s)						

Dissemination Measures		Total	Nationality	Gender	Theme	Language	Comments
14a	Number of conferences/seminars/workshops organised to present/disseminate findings from Darwin project work	6 8			Exit Conference Quarterly TWG Meetings		TWG postponement due to COVID restrictions on meetings
14b	Number of conferences/seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.						

Physical Measures		Total	Comments
20	Estimated value (£s) of physical assets handed over to host country(s)		
21	Number of permanent educational, training, research facilities or organisation established		
22	Number of permanent field plots established	72	72 riparian plots for on-going assessment – 36 inside FS; 36 outside FS

Financial Measures		Total	Nationality	Gender	Theme	Language	Comments
23	Value of additional resources raised from other sources (e.g., in addition to Darwin funding) for project work <i>(please note that the figure provided here should align with financial information provided in section 9.2)</i>						In-kind support from ZSL and DENR.

<b>Code No.</b>	<b>Description</b>	<b>Gender of people (if relevant)</b>	<b>Nationality of people (if relevant)</b>	<b>Year 1 Total</b>	<b>Year 2 Total</b>	<b>Year 3 Total</b>	<b>Total to date</b>	<b>Total planned during the project</b>
6A	Village Agent training	F-10, M-3	Filipino			13	13	12
6A	Native Tree/Bamboo Nursery Establishment Training	Y2 (F-16, M-9) Y3 (F-45, M-63)	Filipino		25	108	133	30
6A	CoMSCA training	Y2 (F-158, M-121) Y3 (F-169, M-72)	Filipino		279	241	520	400
6A	Para-legal Training for River warden	Y2 (F-6, M-59) Y3 (F-4, M-34)	Filipino		65	38	103	
6A	Tagging orientation training	Y2 (F-27, M-23)	Filipino		50		50	50
6A	MEAT	(F-7, M-48)	Filipino		55		55	
6A	Skills Training of freshwater fish culture	Y3 (F-8, M10)	Filipino			18	18	

## Annex 4 Aichi Targets

	Aichi Target	Tick if applicable to your project
1	People are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	X
2	Biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	X
3	Incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.	
4	Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.	
5	The rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.	X
6	All fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.	X
7	Areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.	X
8	Pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.	X
9	Invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	X
10	The multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	
11	At least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.	X
12	The extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.	
13	The genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	
14	Ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	X

15	Ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.	
16	The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	
17	Each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	
18	The traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	X
19	Knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	X
20	The mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.	

## Annex 5 Publications

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Nationality of lead author	Nationality of institution of lead author	Gender of lead author	Publishers (name, city)	Available from (e.g. web link, contact address etc)

## Annex 6 Darwin Contacts

<b>Ref No</b>	24-016
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## Checklist for submission

	Check
<b>Is the report less than 10MB?</b> If so, please email to <a href="mailto:Darwin-Projects@ltsi.co.uk">Darwin-Projects@ltsi.co.uk</a> putting the project number in the Subject line.	
<b>Is your report more than 10MB?</b> If so, please discuss with <a href="mailto:Darwin-Projects@ltsi.co.uk">Darwin-Projects@ltsi.co.uk</a> about the best way to deliver the report, putting the project number in the Subject line.	
If you are submitting photos for publicity purposes, <b>do these meet the outlined requirements (see section 10)?</b>	
<b>Have you included means of verification?</b> You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	x
<b>Do you have hard copies of material you need to submit with the report?</b> 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.	
Have you involved your partners in preparation of the report and named the main contributors	x
Have you completed the Project Expenditure table fully?	x
Do not include claim forms or other communications with this report.	