Darwin Initiative Main and Post Project Annual Report

To be completed with reference to the "Writing a Darwin Report" guidance: (http://www.darwininitiative.org.uk/resources-for-projects/reporting-forms). It is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)

Submission Deadline: 30th April 2020

Darwin Project Information

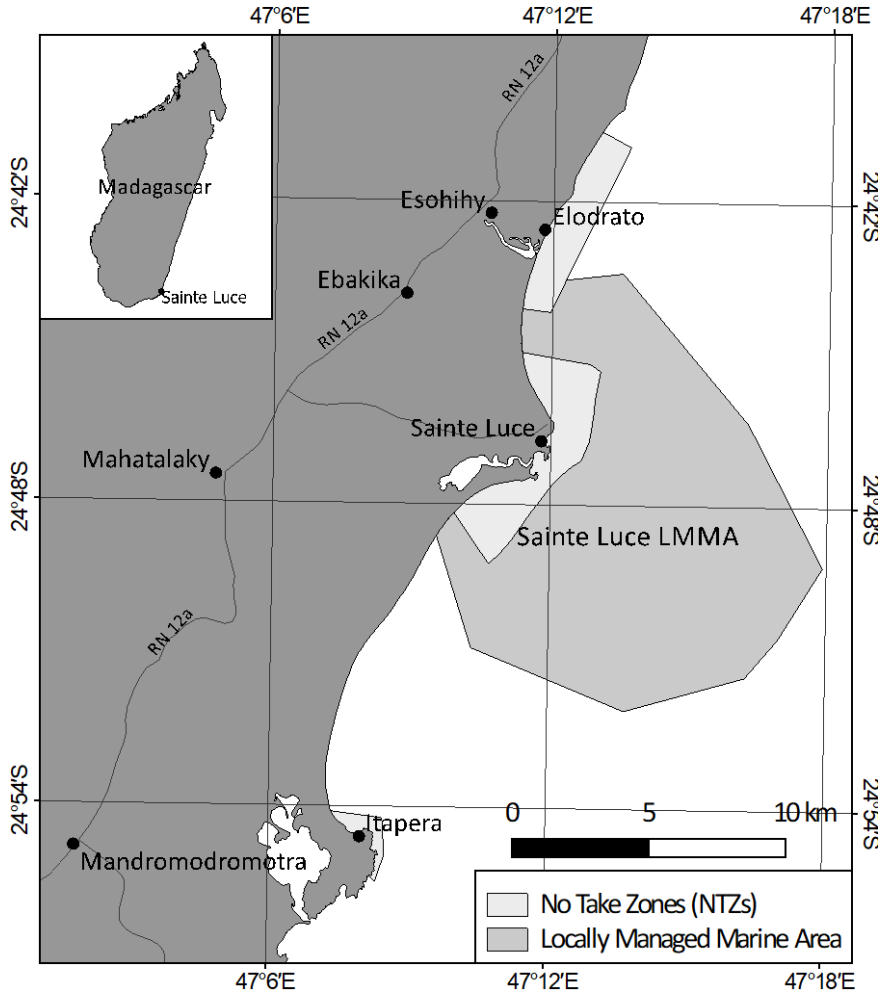
Project reference	25-016
Project title	Promoting community-based management for secure fisheries, biodiversity and livelihoods.
Country	Madagascar
Lead organisation	SEED Madagascar
Partner institution(s)	University College London (Department of Geography); Blue Ventures; MIHARI; Les Directions Régionales des Ressources Halieutiques et de la Pêche (DRRHP); Unité de Recherché Langoustière (URL); Madapeche; Le Martin Pecheur; L'Arrivage; University of Tulear IST.
Darwin grant value	£284,719
Start/end dates of project	July 1st 2018 – March 31st 2021
Reporting period and number	April 1st 2019 – March 31st 2020, Annual Report 2
Project Leader name	Lisa Bass
Project website/blog/social media	https://madagascar.co.uk/projects/sustainable-livelihoods/oratsimba
Report author(s) and date	James Antilahy, Eve Englefield, Sylvestre Mbola, Jeremie Ndriamanja, Octave Rabetany, Jessica Savage, Danick Trouwloon, and Annelin Verkade, 30th April 2020

1. Project summary

Madagascar's south eastern regional lobster fishery, consists of ~40 impoverished artisanal fishing communities[1], and accounts for the majority of national catch and export, directly employing 15,000 people. Lobsters are a high value commodity, meaning the fishery's socio-economic value is significant in impoverished rural households[2].

Available data and local fisher knowledge suggest there have been significant declines in lobster stock over recent decades[1], driven by rapid population growth and export market demand leading to increased fishing effort.

As is typical of Madagascar[3], rapid population growth, extreme poverty, and limited state capacity undermine environmental governance capabilities. National legislation is poorly enforced and compliance is weak. Continued overexploitation, the likely cause for declines in catch[4], threatens livelihoods, food security and biodiversity.



Map showing the lobster fishing communities of Sainte Luce, Itapera and Elodrato in the Anosy region, southeast Madagascar. Sainte Luce is formed of three smaller hamlets (Manafiafy, Ampanastomboky, and Ambandrika), which are not drawn. Elodrato serves as the landing site for fishers from Elodrato, Esohihy, Ebakika and a number of smaller hamlets, which are not drawn. The ~160m km^2 Locally Managed Marine Area (LMMA) of Sainte Luce is shown, including its ~13 km^2 periodic No Take Zone (NTZ), which has operated since 2014. Also shown are the boundaries of periodic NTZs introduced in Elodrato and Itapera and in 2015 and 2016 respectively[15].

Lobsters are a keystone species in rocky reef ecosystems, as mid-trophic consumers they play a significant role in food-webs and account for a significant proportion of consumer biomass[4]. Numerous examples show fishery induced population decreases have cascading ecological effects, including on reef ecosystems[5]. Further stock depletion or collapse therefore threatens biodiversity, ecosystem function and ecosystem service provision.

By providing an economic lifeline to impoverished coastal communities with few alternative livelihoods, the fishery protects both marine and terrestrial biodiversity. Endangered turtles and elasmobranchs are caught in the wider fishery (Annex 4), but most fishing effort is currently targeted at lobsters. Further depletion of stocks would result in increased targeting of endangered species for which there are existing markets. The target communities are closely tied to remaining Southern Littoral Forests. Madagascar's most threatened ecosystem[6], these forests exhibit exceptional levels of biodiversity[7] and are home to numerous endangered endemic species[8, 9, 10, 11, 12]. Further stock depletions would dramatically increase pressure on the forest habitat, for example through increased charcoal manufacture - a typical coping strategy of last resort[13].

2. Project partnerships

University College London

University College London's (UCL) Department of Geography collaborated with SEED to undertake a critical and constructive Marine Protected Area Governance (MPAG) analysis[14] of Sainte Luce's Locally Managed Marine Area (LMMA). The analysis identified incentives needed or in need of strengthening and provided recommendations for making the lobster value chain more equitable. It has been written up as a journal article[15] (Annex 5), accepted by the peer-

reviewed journal *Marine Policy* in PY2, and is currently in press (Indicator 1.8). Key insights, such as the need for increased transparency, were implemented in PY2 through project activities and the re-election of the Fisheries Management Committee.

Blue Ventures
Throughout PY2, Blue Ventures (BV) provided MEL support via Skype meetings. In April 2019, two of BV's experienced data collectors trained the project's community data collectors in mobile data collection (Annexes 6 and 7). In March 2020, BV and the Velondriake LMMA they support hosted target community representatives for a cross visit (Indicator 2.3, Annex 8).

MIHARI Network (Madagascar's LMMA network)
The project team has taken part in regional and national MIHARI meetings since the start of the project. In April 2019, a community representative from the Sainte Luce LMMA and project staff attended the national conference in Antananarivo (Indicator 2.6, Annex 9). The project collaborated with MIHARI to organise Madagascar's first lobster forum in October 2019 (Indicators 2.6 and 2.7, Annex 10).

DRAEP – Regional Directorate of Agriculture, Livestock and Fisheries (previously DRRHP)
DRAEP has become increasingly engaged in activities. During PY2, DRAEP regularly visited target communities to communicate state support for community-based fisheries management (Indicator 3.5). DRAEP representatives also attended stakeholder meetings in Fort Dauphin and mass-mobilisation events in the target communities (Annex 11). DRAEP collaborated with SEED in conducting enforcement capacity building with target communities (Indicator 3.5), and provided support during Sainte Luce's *dina* ratification process (Indicator 3.8, Annex 12).

URL – the region's Lobster Research Unit, reporting to DRAEP
The project team has held regular meetings with URL during PY2 to coordinate regional lobster fisheries research and has built URL's capacity through Open Data Kit (ODK) workshops (Annex 13) and English language training (Indicator 2.8). URL also conducted regular visits to target communities (Indicator 2.8, Annex 11).

Madapêche & Le Martin Pêcheur – the region's two largest lobster exporters
Following the entrance and establishment of a Chinese exporter, Santi, during PY1, Madapêche and Le Martin Pêcheur are only very occasionally purchasing lobster in the target communities. While more challenging, the project continues to engage with these stakeholders (Indicators 3.6 and 4.1) through various avenues, including the MIHARI Lite forum and *Le Groupement des Langoustiers de Madagascar* (GLM), the umbrella organisation of lobster exporters in southeast Madagascar (Annex 14).

L'Arrivage – Seafood restaurant in Madagascar's capital
Unfortunately, as a result of the high prices now being offered by Santi, this company has stopped purchasing lobster in the project's target communities and terminated their partnership with the project.

University of Tulear: Institute of Agriculture and Hydrology (IST)
Working with IST, the project team has hosted students to research elements of the nature and state of the region's fisheries. During PY2, in collaboration with Assistant Professor Daniel Raberinary, SEED hosted two research students who undertook scientific studies on alternative livelihoods and zebu ownership in the target communities (Indicator 2.9, Annexes 15 and 16).

3. Project progress

3.1 Progress in carrying out project Activities

Activities – Output 1
The Fisheries Management Committees in Sainte Luce and Elodrato are fully incorporated into the project (Activity 1.1). In Sainte Luce, the Committee was re-elected in August 2019 (month 14, Annex 17). The Elodrato Committee was established in July 2019 (month 13, Annex 18), and both Committees are now taking an active role in project activities, including monthly training sessions (Activity 1.2). Eight fisheries management training sessions have been conducted in Sainte Luce since re-election, and nine in Elodrato since the establishment of the Committee (Annex 19).

Although originally scheduled for PY1, the fisheries management plan (Activity 1.3) will be a result of ongoing meetings between project partners and completed in PY3, to ensure that the content is appropriate and comprehensive. Therefore, the completion of this activity is delayed.

Mapping and marking of the NTZ in Elodrato (Activity 1.4) is behind schedule. The community has not yet decided on the location or size of the NTZ, and therefore this activity is now predicted to take place during PY3. In Sainte Luce, the NTZ is mapped but not yet marked due to technical issues and adverse weather conditions. This was planned to occur as soon as weather conditions improve, but will likely be postponed further due to the COVID-19 pandemic.

The Fishers' Associations in Sainte Luce and Elodrato are registered with the regional Fisheries Ministry (Activity 1.5).

The three data collectors have received five days of intensive training from project partner Blue Ventures in April 2019 on mobile data collection, for the establishment of an elasmobranch catch survey (Annexes 6 and 7). The project team continued to monitor the quality of data collected by community data collectors and conducted regular refresher training sessions (Annex 20) and monthly informal check-ups. It is expected that the lobster monitoring will move to mobile data collection during PY3.

The MPAG case study (Annex 21) was completed during PY1 (Activity 1.8). The associated journal article (Annex 5) was accepted in September 2019 (month 15) and is in press in *Marine Policy*. The analysis has been used to inform the re-election and training of Sainte Luce's Fisheries Management Committee. This activity was completed earlier than anticipated.

Activities – Output 2

Community education (Activity 2.1) is on schedule in Elodrato and Itapera and one session behind schedule in Sainte Luce. During PY2, four sessions were held in Elodrato and Itapera, and one session in Sainte Luce (Annexes 22, 23, and 24).

Community meetings (Activity 2.2) are held in response to project or community needs. During PY2, two community meetings were held in Sainte Luce, covering the re-election of the Fisheries Management Committee and the newly ratified *dina* (Annex 25). One meeting was held in Elodrato to discuss the timing and location of the NTZ, and one meeting was held in Itapera to disseminate the results of the engagement survey. The project is currently one community meeting behind schedule in Elodrato and Itapera. In Elodrato, this is an indication of the sufficiency of alternative community engagement channels. Additional meetings will be held in Itapera in PY3.

One women-only education session (Activity 2.3) has been conducted in Sainte Luce (Annex 26) and Elodrato (Annex 27) in PY2, and none in Itapera. These sessions were planned to take place quarterly during PY2. The delay is the result of the previous Education Specialist, a woman, leaving the project and being replaced by a male Education Specialist. As the project team felt it inappropriate to have women-only sessions be facilitated by a man, an alternative approach (outlined in a change request accepted in April 2020) is being implemented (see Section 3.2, Indicators 2.13 and 2.14).

The project is on track with youth education sessions (Activity 2.4) in all communities and covered, amongst others, NTZs, destructive fishing gear, berried lobsters, and overfishing (Annexes 28, 29, 30, and 31).

Mass-mobilisation events (Activity 2.5) took place as planned, with one held in Sainte Luce and one in Elodrato. In Sainte Luce, a mass-mobilisation event in April 2019 (month 10) marked the end of the national closed season (January-March), during which it is illegal to fish for lobster throughout Madagascar (Annex 32). In February 2020 (month 20), an event in Elodrato focused on the role of stakeholders in community-based fisheries management (Annex 33).

An educational comic book, with a story about lobster fishing and stock decline in Sainte Luce that promotes adherence to national and local lobster fisheries regulations, has been updated and printed (Activity 2.6, Annex 34). Dissemination of the comic book, planned for March 2020 (month 21), was postponed due to the COVID-19 pandemic and the closure of schools.

Radio broadcasts (Activity 2.7), developed in collaboration with URL, occurred as scheduled. Messages on national lobster fishing regulations and oceanic plastic pollution (Annexes 35, 36, and 37) have been broadcast ten times per month from May 2019 (month 11) onwards.

Three cross-visits (Activity 2.8) were conducted between target communities in PY2, as planned (Annexes 38 and 39). In March 2020, fishers and community representatives from the three target communities also conducted a cross-visit to the Blue Ventures supported Velondriake LMMA (Activity 2.9, Annex 8). This followed a PY1 visit, which resulted in the establishment of Elodrato's Fishers' Association. Although this event was originally planned to take place once, the team decided to increase their scope following the success of the first visit. A return visit from Velondriake fishers to Sainte Luce is scheduled for PY3 (Activity 2.10).

No regional MIHARI Sud forum was organised by MIHARI in PY2 (Activity 2.11). Instead, project staff attended an LMMA monitoring workshop organised by MIHARI in December 2019 (month 18) (Annex 40). In April 2019 (month 10), project staff and one community representative from Sainte Luce attended the national MIHARI forum (Activity 2.11, Annex 9). The project also co-organised Madagascar's first lobster forum (MIHARI Lite) during PY2, which was held in October 2019 (month 16) (Activity 2.12, Annex 10). Stakeholders in attendance included several *Chef Fokontany* (village heads), the private sector, URL, DRAEP, and community representatives from target and non-target communities. An Action Plan was developed (Annex 41), and it was planned for responsibilities to be assigned to relevant stakeholders at a meeting in March 2020, which was delayed due to the COVID-19 pandemic.

The project is one *rabbateur* education session behind schedule (Activity 2.13). One session, combined with a workshop for private sector actors (see Activity 3.5), took place in August 2019 (month 14, Annex 42).

The project is on track with skill sharing and capacity building with URL (Activity 2.14). Eight English language lessons were organised from May 2019 (month 11) and an ODK mobile data collection workshop took place in February 2020 (month 20, Annex 13). Regular meetings take place between URL and project staff to coordinate research and identify further capacity building needs. In addition, in PY2, URL made four joint visits to Sainte Luce and one to Elodrato (Annex 11).

Two national research students were hosted by the project in PY2 (Activity 2.15) and conducted research on alternative livelihoods and zebu ownership in the target communities (Annexes 15 and 16).

The project team has been in contact with non-target communities (Activity 2.16) during PY2 at events such as the MIHARI Lite forum. Outreach visits were conducted in March 2020 (month 21) to disseminate the results of the baseline household survey to control communities and to further discuss community-based fisheries management.

The Natural Resource Management (NRM) Committee of Sainte Luce was re-established in July 2019 (month 13). Two meetings and two training sessions relating to marine resources have been held with them since (Activity 2.17), as planned.

Activities – Output 3

As the Fisheries Management Committees in Sainte Luce and Elodrato see enforcement as part of their remit, the team has started to build the enforcement capacity of these Committees rather than establishing separate Enforcement Committees. Activity (3.1) is no longer appropriate.

So far, one enforcement training session (Activity 3.2) has been conducted with the Fisheries Management Committees of Sainte Luce and Elodrato (Annex 43). This is fewer than planned, as enforcement responsibilities had to be assigned and agreed on first and Elodrato's Fisheries Management Committee is focusing on creating a *dina*. The delayed sessions will take place during PY3 and have a reviewed scope to ensure complementarity with fisheries management trainings. Similarly, enforcement patrols (Activity 3.3), planned to occur weekly from month 10, have not yet begun. Once a system has been designed with DRAEP in PY3, patrols will start in Sainte Luce. In Elodrato, they will start once the community has agreed the *dina.*

Collaboration with DRAEP (Activity 3.4) is proceeding as planned. During PY2, DRAEP representatives attended mass-mobilisation events (Annex 11), facilitated the *rabbateur* training, and regularly visited the target communities. Formalisation of fisheries management and

enforcement plans into a local *dina* (Activity 3.6) is well underway in Elodrato, and the *dina* of Sainte Luce has been fully ratified into national law with support from DRAEP (Annex 44).

One skill-sharing workshop (Activity 3.5) with five *collecteurs* in attendance has taken place during PY2, combined with a *rabbateur* education session (see Activity 2.13). Engagement with the private sector remains a challenge for the project, as the private sector actors involved in the Darwin Initiative application are only occasionally purchasing lobster in the target communities (see Section 2). As a result, the scope for skill-sharing workshops has been limited. However, attempts to engage the private sector through a variety of channels have been made during PY2. The project has conducted three meetings with Le Martin Pêcheur, three meetings with Madapêche, and three site visits to target communities with private sector representatives (see Activity 4.2).

Activities – Output 4
Meetings with project stakeholders (Activity 4.1), including partner organisations, community members, government ministries, research institutes, and university representatives, occurred more often than planned during PY2. For example, numerous meetings were held in the lead-up to the MIHARI Lite forum.

Private sector stakeholders visited target communities (Activity 4.2) more often than planned. Only one visit was planned for PY2, but three site visits were conducted, one to each target community. While some visits involved lobster exporters who do not, or only infrequently, purchase lobster in target communities, they are able to influence discussion through GLM. A *collecteur* employed by Santi joined the team on a site visit to Itapera in January 2020 (month 19, Annex 39) and a site visit to Elodrato in February 2020 (month 20, Annex 38), to discuss their role in ensuring the sustainability of the lobster value chain and community-based fisheries management.

Financial literacy trainings (Activity 4.3) are one session behind schedule in Sainte Luce and Elodrato. In Sainte Luce, the sessions were held in October 2019 (month 16, Annex 45) and February 2020 (month 20), and in Elodrato both sessions were held in February 2020 (Annex 46). The sessions covered an introduction to financial management, and saving and budgeting (Annex 47).

3.2 Progress towards project Outputs

Output 1
Two Fisheries Management Committees, in Sainte Luce and Elodrato, have been formally incorporated into the project (Indicator 1.1) (Annexes 17 and 18). Both Committees have been attending training sessions organised by SEED, and are infrequently meeting independently.

Both Committees (30 members in total) attended fisheries management training in PY2 (Indicator 1.2, Annex 19). In Sainte Luce, a baseline KAP survey on fisheries regulations and ecosystem services principles was conducted in April 2019 (month 10) for members that were re-elected, and in September 2019 (month 15) for new members (Annex 48). In Elodrato, the baseline KAP survey was conducted between September 2019 and February 2020 (month 20). Training sessions are planned to continue monthly for both Committees, but may be postponed due to government regulations related to the COVID-19 pandemic. Levels of understanding are planned to be reassessed by month 27.

At community meetings so far, female attendance has been low (Indicator 1.3). In the baseline survey, 50.9% of interviewed women from Sainte Luce identified as being involved in decision making, compared to 88.4% of men (n=102, Annex 49). This was reassessed in the midline household survey, after the project had incurred a delay in women's engagement activities due to the departure of the project's female Education Specialist (see Section 3.1; Activity 2.3). Reported involvement in decision making decreased for women by 7.0 percentage points and men by 2.7 percentage points, increasing the disparity in reported involvement between genders (Annex 50). Efforts to increase women's engagement in all three communities are ongoing, which will be discussed underneath Indicators 2.13 and 2.14 and Section 7. Women's attendance will continue to be encouraged and monitored, and attendance rates will be assessed by month 27.

The Sainte Luce NTZ (13 km^2) has been operational throughout the project and is one of the local management measures included in the ratified *dina* (Indicator 1.4). The placement of marking buoys has been delayed (see Activity 1.4). In Elodrato, the community is in the process of formalising an NTZ in their *dina* (see Indicator 3.7).

Data is being collected to be able to assess an increase in median Catch Per Unit Effort (CPUE) during No Take Zone (NTZ) openings in Elodrato (Indicator 1.5), to be used as baseline when Elodrato has a formalised NTZ.

Alongside supporting the development and marking of the NTZ for both communities, SEED is continuing to promote the benefits of joining a Fishers' Association (Indicator 1.6). A Fishers' Association in Elodrato was established in March 2019 (Annexes 51 and 52) with 46 members and has now grown to 230 members This is estimated to be 76.7% of fishers in Elodrato. In Sainte Luce, there are three Fishers' Associations, one per hamlet, with roughly 350 members in total (an estimated 87.5% of fishers). This indicator has been achieved in both target communities.

Output 2

Community education sessions, aimed at increasing understanding and awareness of fisheries management measures (Indicator 2.1), are held regularly in Sainte Luce and Elodrato (Annexes 23, 24, and 53). The baseline household survey found levels of knowledge on *dina* regulations to be worryingly variable in Sainte Luce, especially considering that fisheries management has been undertaken in this community for at least five years. 88.2% of fishing and non-fishing participants said that they could fish in the next NTZ closure, however 97.6% of people correctly identified that fishing with mask and snorkel is illegal throughout the Sainte Luce LMMA. This was reassessed during the midline household survey, which found knowledge of individual *dina* regulations had increased since the baseline. Correct knowledge on the prohibition of fishing with a mask and snorkel increased to 99.0% of participants and correct knowledge of an NTZ closure increased by 76.0 percentage points to 87.8% of participants (n=98). The baseline household survey also found knowledge on national regulations to be low amongst both fishing and non-fishing participants in target communities. In Sainte Luce, only 38.6% of participants were able to correctly identify all three national regulations; in Elodrato this was 33.3%. These will be reassessed by month 27.

Three cross-visits between target communities, one visit to each community, have been conducted in PY2 to promote cooperation between the communities (Indicator 2.2, Annexes 38 and 39). On average, 33 community representatives attended each cross-visit, with an average of three women attending. In the baseline KAP survey of community cross-visits conducted in November 2019, 35.2% of participants reported cooperation between the three communities to manage the lobster fishery, 100.0% reported that the communities should increase cooperation in the future and 97.1% reported that there are benefits to increased cooperation (n= 34). This will be reassessed by month 24. The achievement of this indicator is ongoing, and the team will work towards increasing female attendance during PY3.

Cross-visits to the Velondriake LMMA in southwest Madagascar are intended to promote support for a permanent marine reserve in Sainte Luce (Indicator 2.3). Representatives from all three target communities visited the Velondriake LMMA in March 2020 (month 21) (Annex 8). The cross-visit involved 14 community representatives (five of which were women). After the visit, the representatives hosted an education session in their respective communities (Annexes 23 and 24). They presented what they learned and also explained about the permanent and temporary reserves of the Velondriake LMMA. Baseline support for a permanent marine reserve was assessed through a KAP survey with the Fisheries Management Committee, with 20.0% of members demonstrating full or some support (n=15), and the midline household survey, with 21.4% of households surveyed demonstrating full or some support (n=98). This will be re-assessed in month 27, after representatives of the Velondriake LMMA visit the Sainte Luce LMMA.

The first *rabbateur* education session, focusing on national fisheries regulations took place in August 2019 (month 14) (Indicator 2.4, Annex 42). 14 *rabbateurs* attended, 35.7% of whom were female. A baseline KAP survey on national and local fisheries regulations and ecosystem services principles was conducted and will be combined with an endline survey in month 27 to measure changes in the *rabbateur's* levels of understanding (Annex 54).

Youth education sessions promoting age-appropriate understanding of fisheries management measures, marine biodiversity, and natural resource management (Indicator 2.5, Annex 31) are ongoing. Eight sessions per school per community have been conducted in PY2, with two schools each in Sainte Luce and Elodrato and one school in Itapera. On average, 66 students per school attended each session (averaging 71 students in Elodrato, 75 in Sainte Luce, and 37 in Itapera, 183 in total); 44.0% of students were female. A simple monitoring tool for this indicator has been developed, using an activity where children raise their hands in response to a series of statements (Annex 28). This is being used at the beginning and end of every session, and the results show the number of children demonstrating correct knowledge increasing after each session. Educational comic books have been designed and printed, but their distribution has been postponed to PY3 due to the COVID-19 pandemic (Annex 34).

Attendance at MIHARI forums is aimed at increasing community representatives' understanding of regional and national fisheries management priorities (Indicator 2.6). The national MIHARI forum in April 2019 provided a platform for knowledge sharing on LMMAs and the priorities that need the intervention of MIHARI. The Sainte Luce representative who attended the forum demonstrated, through a semi-structured interview, increased understanding of national and regional priorities of *dina* ratification, livelihood opportunities during fishery closures, national fisheries laws, and community problem solving. 13 target community representatives (five from Sainte Luce, five from Elodrato, and three from Itapera) attended the SEED-organised MIHARI Lite forum, a regional event focused on lobster fishing (see Activity 2.12).

Non-target communities are engaged in various project activities and are increasingly expressing interest in replicating the project's LMMA model (Indicator 2.7). Representatives from 12 non-target lobster fishing communities attended the MIHARI Lite forum, where the LMMA model was promoted and all relevant stakeholders were present. Three non-target communities were also surveyed as control communities for the baseline survey during PY1. In March 2020 (month 21), project staff visited these non-target communities to disseminate the baseline survey results. Community members expressed interest in establishing their own NTZs but highlighted that this may be difficult without buy-in from adjacent communities. More frequent visits from project staff were requested to achieve this.

The project team has established a close relationship with project partner URL, who has joined project staff on several visits to each target community (Annex 11), has attended English lessons and participated in an ODK workshop during PY2 (Annex 13). URL presented data at the MIHARI Lite forum, with various target community representatives in attendance (Indicator 2.8, Annex 55).

In October and November 2019 (months 16 and 17), two national research students were hosted as part of the project (Indicator 2.9) and conducted research on alternative livelihoods and zebu ownership in the target communities (Annexes 15 and 16). Their research contributed to the project's understanding of the state and nature of livelihoods and natural resource exploitation in the area. This makes a total of four students to date; twice as many as originally planned.

Community meetings and education sessions in Itapera (Annex 56) are aimed at increasing knowledge of fisheries management (Indicator 2.10), support for fisheries management (Indicator 2.11), and understanding of national regulations (Indicator 2.12). A baseline community engagement survey conducted in Itapera in June 2019 found that 84.1% of participants believed that current fishing effort levels will have no effect on future catches (n=63). This was reassessed during the midline survey at 31.5%, a 52.6 percentage point decrease (n=73). The baseline community engagement survey also found that 69.8% of participants agreed that lobster fishing will still be a source of income without any fisheries management. In the midline household survey, this was reassessed at 54.8%, a 15.0 percentage point decrease (n=73). Perceived awareness of lobster stock decline, measured for the first time during the midline household survey, was reported by 94.5% of participants. Understanding of national fisheries regulations in Itapera was assessed during the baseline household survey and reassessed during the midline household survey. Correct knowledge of all three national fisheries regulations was remained low during the midline, demonstrated by 28.2% of participants. However, this is an increase of 2.1 percentage points from the baseline. Knowledge of individual regulations varied: knowledge on the prohibition on landing berried

females increased by 11.3 percentage points to 57.7%, and knowledge on the national closed season for lobster fishing increased by 0.7 percentage points to 77.5%. Knowledge of the minimum landing size decreased by 3.0 percentage points to 52.1%.

The project is training two Marine Ambassadors from each target community (Indicator 2.13) to conduct women-only education sessions (Indicator 2.14). Four female Marine Ambassadors, two from Sainte Luce and two from Elodrato, have attended one facilitation and two fisheries management training workshops during February and March 2020 (months 20 and 21, Annex 57). The Marine Ambassadors have delivered the first of four women-only education sessions in Elodrato and Sainte Luce (in two hamlets in each of the two communities, Annexes 26 and 27). Two female Marine Ambassadors from Itapera will be identified in PY3; no women-only education sessions have been delivered yet in this community.

Output 3

In both Sainte Luce and Elodrato, the Fisheries Management Committees (15 members per Committee) have chosen to be responsible for enforcement (Indicator 3.1). One enforcement training session (Indicator 3.2) has been conducted with each Committee so far (Annex 43).

The achievement of a 1:1 ratio of reported and confirmed *dina* infractions (Indicator 3.3) is ongoing. With Sainte Luce's *dina* ratified into national law, it is likely that this will be achieved in this community. Elodrato's *dina* is currently being designed, and the achievement of this indicator in Elodrato is contingent on the amount of time involved both in designing the *dina* and it being taken up by the community.

2018 lobster catch data revealed 39.2% of catch was below the minimum landing size of 20 centimetres (Indicator 3.4, Annex 58). This is an underestimate, since lobsters below 16 centimetres are not consistently sampled; fishers often do not allow smaller lobsters to be measured. Data collectors now record the number of unmeasured lobsters. Catch of berried females is shown to vary seasonally, but 2019 catch data is still in the final stages of auditing and data analysis on size and landing of berried females has not yet been carried out.

DRAEP collaborates with SEED in providing enforcement capacity building to the Fisheries Management Committees (Indicator 3.5, Annexes 11 and 12). During PY2, DRAEP representatives conducted five site visits to Sainte Luce and two to Elodrato, two of which with two representatives in attendance. Regular meetings also take place between project staff and DRAEP representatives in town.

Engagement with private sector stakeholders has been a challenge for the project (see Sections 2, 9, and 10) and the scope for conducting skill-sharing workshops (Indicator 3.6) has been limited. One workshop has taken place so far, and the project adapted to pursue alternative communication channels during PY2 (see Activity 3.5). In month 27, the extent to which this has resulted in exporters and *collecteurs* demonstrating an understanding of the target communities' management priorities will be assessed.

The development of the *dina* in Elodrato (Indicator 3.7) is ongoing. Once Elodrato's Fisheries Management Committee has finished designing the *dina*, it will be presented to the wider community for approval. The project team is confident that a *dina* will be agreed by month 27.

The achievement of Indicator 3.8 is ongoing. The Sainte Luce *dina* was formally ratified into national law by the Provincial Court of Appeals' Fort Dauphin Tribunal in September 2019 (month 15, Annex 44) – a process which took six years. Elodrato is currently designing its *dina* (see Indicator 3.7). Due to the experience of Sainte Luce's *dina* ratification process, it seems unlikely that Elodrato's *dina* will be formally ratified before the project's end. The team is nevertheless confident that the *dina* will be in the process of ratification by month 27.

Output 4

Agreement on a plan between private sector representatives and project stakeholders to maximise the sustainability of the fishery (Indicator 4.1) is ongoing. An important step towards this has been the organisation of the MIHARI Lite forum (Activity 2.12, Annex 55). All stakeholders, including government bodies, fisher representatives, and private sector actors were present at this two-day event, which resulted in the draft of a shared Action Plan to improve the management of lobster fisheries and exploitation of lobster stock in southeast Madagascar (Annex 41).

There has been an apparent decrease in independent *pirogue* ownership (Indicator 4.2). In Sainte Luce, the percentage of households that reported owning a *pirogue* decreased from 40.2% to 29.4% between the baseline and the midline. In Elodrato, *pirogue* ownership decreased from 13.7% to 8.5%. Self-reported household *pirogue* ownership observed during the baseline was higher compared to a study conducted in 2018, which calculated *collecteur* ownership of individual *pirogues*[17]. Self-reported *pirogue* ownership used in the baseline and midline may therefore be over reported. It should also be noted that whilst fishers are aware of the benefits of independently owning a *pirogue*, purchasing a *pirogue* is a significant economic investment and fishers report increasing difficulty in sourcing suitable wood due to regulations on deforestation.

The team is monitoring lobster catch and fishing effort in each of the target communities through the participatory monitoring programme (Indicator 4.3). Combining data on price and effort enables average income per fisher to be calculated, which will be used to assess fisher income increases during NTZ openings (Indicator 4.4). Data for the 2019 season are currently being input and has as of yet not been analysed, although anecdotal evidence suggests that there have been no increases in the price of lobster in Sainte Luce over the last season.

Financial management workshops are held in Sainte Luce and Elodrato to promote annual household financial management plans and involvement in financial decision making (Indicator 4.5). A financial management survey, as well as two focus groups divided by gender, conducted in Sainte Luce in October 2019 (month 16) and in Elodrato in February 2020 (month 20), provided the baseline data related to current household financial management practices (Annex 59). 98.2% of participants in Sainte Luce and 84.5% of participants in Elodrato reported being involved in financial decision making, with more women than men reporting involvement in both communities. The ability to pay for an unexpected expense, the interpretation of which was left open to participants, was reported by 53.4% of participants in Elodrato and 84.2% in Sainte Luce (n=115). Two financial management workshops were held in Sainte Luce and Elodrato (Annex 45 and 46). During the second session, annual household financial plans were presented as a simple budgeting method. The February workshops were timed to take place just before the end of the national closed season. It is hoped that conducting the workshops at this time would have more impact on households' financial management decisions once the season opened.

3.3 Progress towards the project Outcome

In October 2019, an approved change was made to the project Outcome, which reduced the number of fishers and community members impacted through the project. This was the result of a change with the community of Itapera, after concerns in the community about the NTZ management approach. The team continues to make progress towards the updated outcome, building local and regional capacity to implement adaptive, sustainable fisheries management through developing community-level management committees and Fishers' Associations. In addition, the training of communities and state bodies continues in recognition of the benefits to this approach.

The baseline household survey (Annex 49) established that all lobster and non-lobster fishing households are below the locally defined poverty level (Indicator 0.1, n=197). The final overall reduction in household poverty levels in the two target communities (Elodrato and Sainte Luce) will be measured in month 27, through an endline household Modified Basic Necessities Surveys (MBNS).

The baseline of zebu ownership (Indicator 0.2) was measured at 1.5 (n=137) on average per target community lobster fishing household. This figure is different to that quoted in the PY1 annual report, as Itapera was omitted from the analysis due to the change in approach. The midline household survey reported overall zebu ownership at 1.3 (n=167) on average per target community lobster fishing household (Annex 50). Disaggregating the data by target community shows a 33.3 percentage point increase in Sainte Luce, but a 45.8 percentage point decrease in Elodrato. Therefore, the project is on track to achieve this target in Sainte Luce but experiencing an unexpected decline in Elodrato. The observed decrease in zebu ownership in Elodrato is difficult to identify. The decrease may be caused by an increase in poverty levels in Elodrato, whose causes lie outside the scope of the project. Whilst collecting data through the baseline

and midline household surveys has been a good first step, alternative data collection methods that do not rely on self-reporting, such as community level ownership or vaccine records, will be explored as necessary during PY3. As stated in the original funding application, this is a pilot analysis of using zebu ownership as a proxy indicator of wealth.

Levels of self-reported unsustainable livelihood practices have also been monitored (Indicator 0.3). These practices include non-selective freshwater fishing practices (mosquito net fishing), with a baseline of 30.5% of target community households, and fishing for sharks in 47.4% (n=131) of target community households. These figures are different to those quoted in the PY1 Annual Report, as a result of the change in approach with Itapera. The midline household survey indicated a decline in mosquito net fishing by 3.7 percentage points in Sainte Luce and by 4.9 percentage points in Elodrato. The percentage of households reporting participation in shark fishing decreased by 2.5 percentage points in Sainte Luce and 3.2 percentage points in Elodrato (n=189). In Sainte Luce, self-reported frequency of mosquito net fishing and shark fishing during NTZ closures has decreased by 22.5 percentage points for mosquito net fishing and 1.4 percentage points for shark fishing. The participatory monitoring programme was extended in September 2019 (month 15) to include data collection on elasmobranchs (sharks and rays), considering species abundance and size, sale value, and prevalence of selling fins (Annex 4). A pilot of observational monitoring of mosquito net fishing started in November 2019 in Sainte Luce (Annexes 60 and 61).

A permanent marine reserve in Sainte Luce is a long-term goal of this project (Indicator 0.4). While the idea of a permanent reserve has been presented to community members through the midline household survey and the cross-visits to the Velondriake LMMA (Activity 2.9), the current focus is on creating a strong Fisheries Management Committee and LMMA as a foundation for success of a permanent reserve. Therefore, more formal community consultations will start during PY3. The endline household survey will establish the percentage of community members in Sainte Luce who show 'complete support' for a permanent marine reserve.

3.4 Monitoring of assumptions

Assumption 1 (Linked to Outcome 0.1): BNS (Basic Necessities Survey)[16] is the most appropriate measure of poverty, changes in poverty levels are directly affected by income generated through livelihood activities and external factors (infrastructure, access) remain constant.
Comments: The BNS is still believed to be the most contextually appropriate method for measuring poverty levels due to its ability to create a locally defined poverty index quickly, reliably, and effectively. The European Union (EU) is funding road repairs along parts of the road to Fort Dauphin as part of Madagascar's External Investment Plan (EIP), but this is not due for completion until the end of 2021, falling outside the timeframe of this project.

Assumption 2 (Linked to Outcome 0.2): Zebu purchase continues to serve as a mechanism for financial saving/investment in rural communities without access to formal banking systems.
Comments: This assumption is based on hundreds of years of cultural tradition, and still holds true. It was supported during the baseline BNS, where 76.6% of households reported zebu to be a basic necessity (Annex 49). Anecdotal evidence also suggests people are still using zebu as financial saving mechanisms. The project is researching adequate ways of acquiring zebu ownership data, as face-to-face interviews have so far provided inconsistent results.

Assumption 3 (Linked to Outcome 0.3): Increased income from No Take Zone (NTZ) opening periods reduces frequency of damaging livelihood activities in line with pilot project.
Comments: As stands, this assumption holds true. The project monitors the incidence of damaging livelihood activities through self-reporting, and a decrease in self-reported frequency of mosquito net fishing and shark fishing was observed during NTZ closures in Sainte Luce (see Section 3.3, Indicator 0.3).

Assumption 4 (Linked to Outcome 0.4): Community and fisher interest in sustainable fisheries management remains high in Sainte Luce, with significant benefits from temporary NTZ closures perceived and providing enough motivation for the community to engage in consultation for a permanent marine reserve.

Comments: In August 2018 (month 2), interest in participating in temporary NTZs was 80.0% for Sainte Luce (n=20)[17]. Since this survey was administered, there has been no indication that this majority has decreased or community-level motivation for NTZs has dropped in Sainte Luce.

Assumption 5 (Linked to Outputs 1.1, 1.4, 2.1, 2.10, 2.11, 2.12, 3.4 & 4.5): Community and fisher interest in sustainable fisheries management and capacity building remains high in target communities.
Comments: Community-level support for temporary NTZs was 88.0% for Elodrato (n=25) in August 2018. Engagement remains high in Elodrato, with the establishment of a Fishers' Association in March 2019 (month 9) and a Fishery Management Committee in July 2019 (month 13) providing additional momentum.

Assumption 6 (Linked to Output 1.2, 2.2 & 2.3): Transport between the regional capital, Fort Dauphin, and target communities remains possible, and is not affected by poor road conditions or extreme weather.
Comments: The national road (RN12) between Fort Dauphin and the project target communities remains passable by 4x4 and motorbike. Although extreme weather causes this road to be impassable and unsafe at times, the team adapts by re-scheduling project activities accordingly. Madagascar first confirmed cases of COVID-19 on the 20th March 2020. SEED Madagascar is prioritising the health of its team and the communities it supports. To prevent the spread of the virus, SEED paused transport to, and activities in, target communities in mid-March 2020. At the time of writing, some activities have been resumed although with a reduced scope.

Assumption 7 (Linked to Output 1.3 & 2.14): Women from fisher households are motivated to engage with the project.
Comments: This assumption holds true, although women's attendance at some project activities remains low. The project is training Marine Ambassadors, who held their first women-only community meetings in February 2020 (Annex 26 and 27), and women from fisher households are involved in the project through financial trainings, fisheries cross-visits, and *rabbateur* trainings.

Assumption 8 (Linked to Output 1.5 & 4.4): NTZ induced changes in spatio-temporal distribution of effort replicates previously documented impacts on CPUE.
Comments: As stands, this assumption holds true. Once the participatory monitoring data for 2018 and 2019 has been analysed, the team will be able to assess this assumption in detail.

Assumption 9 (Linked to Output 1.6): Fishers are motivated to join registered associations of fishers to secure access rights and protect against incoming users.
Comments: In Elodrato there has been proven interest to join a Fishers' Association, with 230 members now registered. During focus groups to inform the baseline survey, there was anecdotal evidence that many fishers in Sainte Luce also understand the benefits and opportunities of membership of a Fishers' Association.

Assumption 10 (Linked to Output 1.8): Data is sufficient to produce a peer-reviewed article.
Comments: Investigation produced sufficient data of sufficient quality to produce a paper, which is currently in press to be published in the peer-reviewed journal *Marine Policy*[15] (Annex 5).

Assumption 11 (Linked to Output 2.3 & 2.6): Regional and national LMMA networks remain active.
Comments: The MIHARI network remains active, and project staff and community representatives participate in relevant meetings and forums. In October 2019, the project co-organised Madagascar's first regional lobster forum in collaboration with the MIHARI network (Annex 10).

Assumption 12 (Linked to Output 2.4): *Rabbateurs* (buyers at the first point of sale) are engaged and actively participate in project activities.
Comments: This holds true; the first *rabbateur* training session took place in August 2019 (Annex 42).

Assumption 13 (Linked with Output 2.5): Cooperation and sustained interest from educational authorities and teachers continues and engagement is unaffected by national standardised tests.

Comments: Terms of Reference with regional authorities and head teachers in each of the three target communities were signed in PY1 both to give permission for and endorse the education sessions being run as part of this project (Annex 62).

Assumption 14 (Linked to Output 2.8): URL representatives are engaged and actively participate in project activities.
Comments: URL has taken part in numerous project activities and capacity building workshops, as elaborated on in Section 3.

Assumption 15 (Linked to Output 2.9): National research in the wide variety of topics related to marine livelihoods and LMMAs remains high, remoteness of site and high costs of travel to Anosy do not inhibit international research interest.
Comments: During PY2, students from IST, a national research institute, conducted research in these subjects within the Anosy region, without major restrictions related to cost or travel conditions. Further international research projects are being explored.

Assumption 16 (Linked to Output 2.13): Marine Ambassadors continue to be engaged with the project and attend training workshops.
Comments: The Marine Ambassadors have attended training workshops, and have also joined in other project activities, such as a cross-visit to the Velondriake LMMA.

Assumption 17 (Linked to Output 3.2 & 3.5): DRAEP and *Gendarmerie* (military police) remain supportive of project activities, including reinforcement of patrols.
Comments: DRAEP has taken part in numerous project activities, as elaborated in Section 3. The *Gendarmerie* supports the Sainte Luce Fisheries Management Committee in addressing *dina* infractions.

Assumption 18 (Linked to Output 3.3): Enforcement bodies consistently and accurately complete records of infractions and prosecutions.
Comments: Enforcement of LMMA regulations is currently only taking place in Sainte Luce where the Fisheries Management Committee is maintaining these records (Annex 63). Once a *dina* has been agreed in Elodrato, this assumption will be tested there.

Assumption 19 (Linked to Output 3.6): Private sector remains active in Anosy region and engaged with project activities.
Comments: The private sector has remained active in Anosy, but actors previously engaged with the project are only occasionally buying lobster in the target communities. Attempts have been made to engage with Santi, the exporter now dominating the market (see Section 10).

Assumption 20 (Linked to Output 3.1): Communities maintain motivated to implement management measures.
Comments: See comments for Assumptions 4 and 5.

Assumption 21 (Linked to Output 3.8): Labour disruptions or other administrative delays do not prevent regular operation of the Provincial Court of Appeals' Fort Dauphin Tribunal, inhibiting the *dina* ratification process.
Comments: The Sainte Luce dina was ratified by the tribunal during PY2 (Annex 44).

Assumption 22 (Linked to Output 4.1): Continued stakeholder understanding of their crucial role in increasing project longevity, sustainability of effective fisheries management, and logistical arrangements for making stakeholder meetings possible, including dates and locations at which all stakeholder are available to attend.
Comments: Key stakeholders remain engaged in the project (see Section 2) and participate actively in project activities (see Section 3.1). Private sector stakeholders are addressed through assumption 19.

Assumption 23 (Linked to Output 4.2): Boat ownership continues to serve as a mechanism for financial saving/investment in fishing communities without access to formal banking systems.
Comments: This assumption has proved inaccurate, as boat ownership acts as an investment mechanism but not strictly as a way of saving. The use of boat ownership remains an important measure of wealth and independence from *collecteurs*, and as such will still be assessed.

Assumption 24 (Linked to Output 4.3 & 4.4): Continued demand on global markets for lobster from export industry in Fort Dauphin.

Comments: Lobster export continues to be a major industry within Fort Dauphin. The COVID-19 pandemic may challenge this assumption; although ports of cargo remain open at time of writing, all incoming ships must observe 24 days of quarantine, likely decreasing exports.

3.5 Impact: achievement of positive impact on biodiversity and poverty alleviation

The project aims to reduce lobster stock depletions and prevent further degradation to the integrity and productivity of coastal resources in the region. This also contributes to the protection of Madagascar's most threatened ecosystem – the Southern Littoral Forest – from unsustainable livelihood activities and over-exploitation.

Lobsters are keystone species in rocky reef ecosystems, and as mid-trophic consumers, they play a significant role in food-webs and account for a significant proportion of consumer biomass[4]. Numerous examples show fishery induced population decreases have cascading ecological effects, including on reef ecosystems[5]. Further stock depletion or collapse therefore threatens biodiversity, ecosystem function, and ecosystem services.

The continuing efforts made to protect lobster stock long-term should preserve an economic lifeline to impoverished coastal communities with few alternative livelihoods, and protect wider local marine and terrestrial biodiversity. Endangered turtles and elasmobranchs are caught alongside lobster by fishers in this region, and further declines in lobster stocks would only exert more pressure on these species. The ecological significance of turtles is well established[18,19], as is the role of apex- and meso-predators such as sharks that provide a vital regulatory role in marine ecosystems[20].

Despite most fishing effort targeting lobster, fishing for elasmobranchs is practiced in the three target communities, reported as a baseline of 47.4% (n=131) of target households. Elasmobranch catch surveys (Indicator 0.3) have also revealed endangered species such as the Scalloped Hammerhead (*Sphyrna lewini*) being caught by fishers in Sainte Luce[21] (Annex 4). Further depletion of lobster stock would likely result in increased targeting of endangered species for established existing markets. The baseline survey revealed an active shark finning trade across all three target communities, but reports of this behaviour decreased in the midline survey (see Section 3.3, Indicator 0.3, Annexes 49 and 50). Collapses in shark populations frequently result in trophic cascades that significantly impact the productivity of marine ecosystems[22] and threaten the livelihoods with which they are inextricably linked.

Moreover, the severely threatened Southern Littoral Forests exhibit exceptional levels of biodiversity and endemism[23], and are home to numerous endangered macro- and micro-endemic species. Results from the baseline survey showed that self-reported levels of charcoal manufacture and exploitation of forests for firewood, building materials, and bushmeat were low, and were reported as decreasing further in the midline report, yet this would likely increase if lobster stocks were to deplete further.

Within target communities, peoples' wellbeing is directly correlated to the health of their local environment[1]. As such, the impact of effectively conserving natural capital has a secondary influence of alleviating poverty through maintaining the social safety net afforded by the provisioning of exploitable resources through healthy and productive natural systems (see Section 6).

4. Contribution to the Global Goals for Sustainable Development (SDGs)

The project directly addresses SDG 14 (conserve and sustainably use the oceans, seas, and marine resources for sustainable development). In PY2, training efforts of the Fisheries Management Committees (Indicator 1.2) and education sessions for the wider community, including in schools (Indicators 2.1 and 2.5), continued. These sessions build the capacity of beneficiaries to manage their marine resources. State actors, such as DRAEP, are engaged in the project to support the community (Indicator 3.5) and efforts are ongoing to further engage the private sector (Indicator 3.6). With attempts to scale up an established LMMA model, local communities will be empowered to manage their marine resources (SDG 14.2).

Training in mobile data collection and professional skills that took place throughout PY2, will help to build the knowledge and research capacity of URL (Indicator 2.8), and overall, will

contribute to Madagascar's ability to manage sustainable production (SDG 14.A, SDG 12.2). Combining PY2 participatory fisheries monitoring data (Indicators 1.5, 4.3, and 4.4) with data from URL will enable evidence-based stock management (SDG 14.4).

Women are key actors in the lobster value chain and project beneficiaries at the household level, and their contribution to decision making has been actively promoted throughout PY2 (SDG 5.5). In the most recent election of the Sainte Luce Fisheries Management Committee, one female member was elected for the first time. In addition, the Marine Ambassadors training aims to empower women from target communities (Indicator 2.13). By imparting the Ambassadors with the knowledge and skills necessary to inspire other women in their community, it is hoped they will encourage them to participate more actively in the management of their fisheries (Indicators 1.3 and 2.14).

Impacts on the value chain, such as increases in the price received by fishers (Indicator 4.3), will address SDG 1.1. At the baseline financial management survey, 94.7% of lobster fishing households in Sainte Luce (n=57) reported increases in household income following NTZ openings (Indicator 4.4).

5. Project support to the Conventions, Treaties or Agreements

Convention of Biological Diversity (CBD) Articles

Promoting the extension of the LMMA model to Elodrato and contributing to the LMMA network across Madagascar, supports Article 8(a), as lobsters hold economic value and are a keystone species[4]. Avoiding fishery collapse decreases pressure on endangered marine megafauna and terrestrial resources, specifically on threatened littoral forests that exhibit exceptional biodiversity and endemism[7] (Indicator 0.3). Managing this resource therefore fulfils Article 8(c). Communities are supported to develop and implement their own management measures, taking into account local knowledge, innovations and practices, in line with CBD Article 8(j).

Through supporting the implementation of measures to sustainably manage depleted lobster stocks, the project contributes to Article 10(d). Improved cooperation between communities, the state and the private sector (Indicators 2.2 and 2.7) has been facilitated through stakeholder meetings (Annex 10), fulfilling Article 10(e). By using the economic and social benefits of the NTZ to incentivise sustainable practices, the project supports efforts towards Article 11.

Strategic Plan for Biodiversity 2011-2020

This project supports Aichi Target 1 (Strategic Goal A) through education sessions with the target communities, highlighting the value of managing lobster stocks sustainably to promote biodiversity and the links to food security. To increase compliance with national law, the project has been working to build the enforcement capacity of the Fisheries Management Committees in Sainte Luce and Elodrato, contributing to Aichi Target 6 (Strategic Goal B; Indicator 3.4).

The establishment of an LMMA in Elodrato will contribute to Aichi Target 11 (Strategic Goal C), through increasing the percentage of conserved and sustainably managed marine areas. Links have been fostered between target communities through cross-visits and meetings (Indicators 1.1 and 2.2, Annexes 38 and 39). Engagement with MIHARI (Indicator 2.6) promotes a well-connected network at both the regional and national level. By ensuring LMMAs are well connected, and communities are linked, the project is further contributing to Aichi Target 11.

Periodic NTZs (Indicator 1.5) aim to safeguard ecosystem service provision and alleviate poverty, contributing to Aichi Target 14 (Strategic Goal D). Due to the participatory approach to data collection and results dissemination, local knowledge, innovations, and practices are respected and fully integrated, contributing to Aichi Target 18 (Strategic Goal E). The project's participatory monitoring (Indicator 1.8) and analysis dissemination contributes directly to Aichi Target 19 (Strategic Goal E).

The Promise of Sydney

Resulting from becoming a signatory of the Promise of Sydney, Madagascar's Biodiversity Action Plan (2015-2025) sets the goal of adequately conserving 15% of marine areas by 2025. The project's LMMAs will contribute to these obligations (Indicator 0.4).

6. Project support to poverty alleviation

The project works to alleviate poverty in Sainte Luce and Elodrato. Lobster fishing households are expected to be primary beneficiaries, with an additional focus on women's empowerment (see Section 7). The baseline survey found 100% of surveyed households in both target and control communities (n=553) to be below the locally defined poverty level (Annex 49).

As outlined in SEED's published research on the short-term impacts of periodic NTZs[1], the model predicts catch yields to increase by approximately one third following NTZ closures, while fishers are expected to receive higher prices as buyers compete for stocks (Indicators 4.3 and 4.4). This represents an important direct increase in income for the 700 lobster fishers in the project's target communities. At the baseline financial management survey, 94.7% of lobster fishing households in Sainte Luce (n=57) reported increases in household income following NTZ openings (Indicator 4.4). In combination with financial literacy trainings (Indicator 4.5, Annexes 45, 46, and 47), this increase in income for lobster fishers is expected to strengthen the economic resilience of lobster fishing households (Indicator 0.1) and encourage investment in context appropriate assets such as zebu and *pirogues* (Indicators 0.2 and 4.2).

By ensuring the sustainability of the regional lobster fishery the project also contributes to job security for lobster fishers and middlemen (*rabbateurs* and *collecteurs*).

7. Consideration of gender equality issues

In target communities the act of lobster fishing is carried out exclusively by men. While women perform essential pre- and post-harvesting activities that support the local lobster value chain, this is seen as an extension of their household tasks and undervalued. As a result, women are often excluded from lobster fisheries management and decision-making.

The baseline and midline household surveys found that women in the target communities felt less involved in decision making as compared to men (see Section 3.2, Annexes 49 and 50). To engage women in fisheries management, the project hosts education sessions exclusively for women (Indicator 2.14), which are led by Marine Ambassadors, who have been trained on facilitation and fisheries management (Indicator 2.13). These sessions function as a platform for women to share their experiences with other women and simultaneously instils them with the confidence, skills, and knowledge needed to address their male counterparts at community-wide meetings. Furthermore, by ensuring representation of women at youth, *rabbateur*, financial, and community education sessions, and fisheries cross-visits (Indicators 2.2, 2.4, 2.5, and 4.5), the project provides women with the knowledge to sustainably manage the lobster fishery.

In previous phases of the project, NTZ openings provided multiple benefits to women in fisher households; directly through increased household income and indirectly through increased demand for goods sold by women[2]. Through financial management training (Indicator 4.5, Annexes 45, 46, and 47), the project aims to maximise equitable household expenditure and investment in productive assets.

Through this holistic approach involving representation, education, and financial empowerment, the project works to address the cultural and structural barriers to women's participation, leading to gender equity and truly community-based fishery management.

8. Monitoring and evaluation

During PY2, monitoring and evaluation activities were carried out by SEED, with technical support provided by project partners Blue Ventures. To establish baselines, monitor progress towards the outcome and outputs, and inform development and adaptation of project activities, the project team conducted household surveys (Indicators 0.2, 0.3, 0.5, 1.3, 2.1, 2.10, 2.11, 2.12, and 4.2), KAP surveys (Indicators 1.2, 2.4, and 3.2), participant surveys and focus groups (Indicators 2.2, 2.3, and 4.5), and semi structured interviews (Indicator 2.6). Project satisfaction focus groups were also held to gauge stakeholder perceptions of project delivery and to enable activity adaptation. Unless otherwise stated, the approaches used to monitor and evaluate activities in PY2 have proven to be suitable by providing adequate data to form baselines and where appropriate adequate midline data to monitor progress between PY1 and PY2.

Ongoing monitoring activities were used to inform changes to the logframe. The logframe has been changed twice during PY2, due to the change in approach with Itapera, the addition of

Marine Ambassadors into the project, and the incorporation of enforcement into the remits of the Fisheries Management Committees. To monitor progress in Itapera after the change in approach, a bi-annual community motivation and engagement survey has been added to the M&E plan. Improvements to monitoring and evaluation have also been made, such as increased collection of qualitative data to supplement quantitative data, coordination of monitoring and evaluation activities to increase efficiency, and increased documentation of project activities. In PY3, alternative data collection methods will be explored in response to beneficiary survey fatigue, and further improvements will be made regarding the documentation of results and lessons learnt, and the dissemination thereof to stakeholders. The use of paper data collection for the lobster participatory monitoring programme has caused delays in data entry and subsequent analysis, therefore transitioning to mobile data collection will be a priority in PY3.

A variety of methods have been used to share information with stakeholders. With communities, information is shared with the Fisheries Management Committees during in-depth training workshops, who in turn communicate this information to community members during community education sessions. With project partner URL, information has so far mostly been communicated during project meetings. Information sharing has been identified by both SEED and URL as an area of improvement for PY3. This has also been identified as an area for improvement with private sector stakeholders, and led to the sharing of a report on project activities and progress in March 2020.

9. Lessons learnt

Mobile Data Collection
The project's participatory data collection programme has moved towards mobile data collection in PY2. Data collection on the elasmobranch survey is entirely mobile, although community data collectors had difficulty using the smartphones and the survey, impacting data quality. Transition of mobile data collection of the lobster surveys will be made once the data collectors are accurately and reliably collecting the elasmobranch data.

SEED has learnt it is important to organise the phones, apps, and surveys to be as easy as possible to use. Regular refresher trainings, both informal check-ups in the field and more formal training sessions, are key to reinforced and continued learning. To learn from each other, the team organised cross-visits for the data collectors, which they have continued to organise independently. SEED will create a survey guidebook for the data collectors to refer to.

Private Sector Engagement
The private sector stakeholders involved in the application are only occasionally operating in the target communities (see Section 2). Attempts to engage with Santi, which is now purchasing the majority of lobster from the target communities, have been met with limited success.

Instead, the project is trying to influence Santi by working with GLM, through activities such as the MIHARI Lite forum (Activity 2.12) and meetings with individual exporters such as Madapêche and Le Martin Pêcheur, whose values align more with the project's despite their move out of the target communities. By acknowledging that Assumption 19 no longer holds true, the project has moved beyond the originally planned workshops and implements a more targeted approach, demonstrating the importance of remaining adaptive (see below).

Community representatives and structures leading education activities
In PY2, multiple education sessions have been delivered involving community representatives and structures, such as data collectors, Marine Ambassadors, and Fisheries Management Committees. This not only increases the capacities of the community members conducting the activities, it also increases overall engagement in the sessions. SEED will continue to find similar opportunities during PY3, and recommends this strategy to other projects.

Stakeholder engagement
During PY2, the project team has fostered close relationships with key stakeholders, such as URL and DRAEP. This has made it easier to implement activities together and to ask for support when needed. The team will continue to build these relationships during PY3.

10. Actions taken in response to previous reviews (if applicable)

Evidence provision

Some crucial project deliverables were not annexed in the previous annual report. The MPAG case study (Indicator 1.8) can be found in Annex 21 and the baseline survey report in Annex 49. Throughout this report, evidence is coded with an annex number and referenced.

Remaining open to adaptation
A focus in PY2, as recommended in last year's review, was identifying critical blockers to the project, and finding ways to mitigate these. This was ongoing throughout the year, but the team has also held several half-day workshops to identify and discuss these. Crucial identified blockers were the lack of a Fisheries Management Committee in Elodrato, difficulty engaging with Itapera, women's engagement (see Section 7), enforcement (see Section 3), and private sector stakeholder engagement (see below).

During PY1, progress in Elodrato and Itapera was slower than anticipated. In Elodrato, the community requested support to establish a Fishers' Association before a Fisheries Management Committee. Although doing this caused some further delays, it has ensured the community is fully on board with the project and now has a strong Committee (Annexes 17 and 18).

In Itapera, there was no consensus on how to proceed with community-based fisheries management and the establishment of an NTZ. This has been addressed in a change request accepted in October 2019 (month 16). The project team is focusing on increasing awareness of declining lobster stock and increasing compliance with national legislation (Annex 56).

Private sector stakeholder engagement and including Santi in the project
In the project design phase, three private sector stakeholders were identified to be project partners (See Section 2). Following the entrance and establishment of a Chinese exporter, Santi, during PY1, Madapêche and Le Martin Pêcheur are now only very occasionally purchasing lobster in the target communities and L'Arrivage is not purchasing at all. This has made it challenging to engage these stakeholders in project activities.

In PY2, the project has conducted three meetings each with Madapêche and Le Martin Pêcheur (Activity 3.5), and representatives of these stakeholders have attended three site visits, one to each target community (Activity 4.2). Meetings held with Madapêche and Le Martin Pêcheur as part of the auditor's visit for the Mid-Term Review of this project in January 2020, revealed that each party's interests lie closer than expected.

The project team is also engaging directly with GLM, the umbrella organisation of lobster exporters in southeast Madagascar, of which Madapêche, Le Martin Pêcheur, and Santi are all members. It is expected that stakeholders such as Madapêche and Le Martin Pêcheur, the two largest lobster exporters in the Anosy region, will influence discussion within GLM.

A catalyst for private sector stakeholder engagement was the MIHARI Lite forum (Activity 2.12, Annex 10) co-organised by SEED, where fishers, state actors, the private sector, and NGOs came together to create an Action Plan for the sustainability of the lobster fisheries. Private sector stakeholders in attendance included representatives from Le Martin Pêcheur, Madapêche, SOI-EXT, and Huang Hua Gen. The latter two exporters are active in the Anosy region, but not in the target communities. A representative from Santi was also present at the first day of the MIHARI Lite forum. GLM held a presentation on the regional lobster value chain (Annex 14).

Engaging with Santi remains a challenge; Santi did not reply to an invitation to meet with the project team as part of the auditor's visit. Nevertheless, a *collecteur* employed by Santi joined the team on site visits to Itapera and Elodrato in January and February 2020 (months 19 and 20) (see Activity 4.2). The project team will continue to try to engage Santi through inviting them for meetings and activities such as site visits, and will continue with efforts to engage GLM and other stakeholders, as this is expected to have a positive impact on the behaviour of Santi.

Focus resources on engagement with Itapera and Elodrato
During PY2, the team has especially focused on Elodrato to bring the project timeline back on track for this community. The team is on schedule again with fisheries management trainings (Activity 1.2), community education sessions (Activity 2.1), women-only education sessions (Activity 2.3), youth education sessions (Activity 2.4), site-visits from DRAEP (Activity 3.4) and the private sector (Activity 4.2), and financial trainings (Activity 4.3). The establishment of the

Fisheries Management Committee (Activity 1.1) has been key to this, as the Committee is now leading the design of the *dina* and establishment of the LMMA.

As outlined above, in PY2 the approach to the community of Itapera has changed. The team is committed to meet both original indicators still relating to this community, and the new indicators (2.10, 2.11, 2.12), which will be assessed by month 27.

11. Other comments on progress not covered elsewhere

SEED collaborated with the University of Roehampton to organise the Festival of the Sea in Sainte Luce, with funding from the Arts and Humanities Research Council and Rising from the Depths Network[a]. The festival aimed to facilitate the celebration of marine heritage, common ancestry, tradition, and natural capital in Anosy. The festival worked alongside this project, and served as a platform for information-sharing regarding community-based lobster fisheries management and collaboration between communities.

12. Sustainability and legacy

SEED has developed relationships with a range of stakeholders to promote and strengthen the work of the project on a regional, national, and international level. The project team has engaged with the MIHARI network to increase learning opportunities from other LMMAs, for example at the MIHARI Lite forum (Activity 2.12, Annex 10). The forum discussed the importance and impacts of LMMAs, berried lobster catch as 'a pitfall of lobster exploitation', and dynamics of the lobster value chain. The development of an Action Plan as a result of this conference highlights that interest and motivation remains high amongst stakeholders.

SEED has led training sessions with stakeholders during PY2 to help build lasting capacity amongst key stakeholders. For example, URL has been trained on the use of ODK software (Annex 13) and mobile data collection and has received English lessons.

The ratification of Sainte Luce's *dina* into national law (Annex 44) supports long-term, community-led enforcement. Discussions on a *dina* for Elodrato are underway, and it is hoped that it will be created and ratified during PY3.

Following the successful cross-visit of fishers from Elodrato to the Velondriake LMMA on the southwest coast in PY1, a second cross-visit took place in March 2020 (month 21, Annex 8), including representatives from all target communities. Both visits have promoted the project in-country and strengthened relationships with partner organisations, such as Blue Ventures, to facilitate future learning opportunities between organisations at a more national scale.

The MPAG, co-published between SEED and UCL (Annex 5), is publicly available through the journal Marine Policy (in press, available online from October 2019). This open-access publication contributes to the knowledge of governance within Marine Protected Areas across the international scientific community. Key findings from the research have informed project implementation, such as increased transparency with the Fisheries Management Committee, to strengthen the lasting impact of the project with respect to community governance structures.

As highlighted in the MTR Aide-memoire report, the planned exit strategy requires review and the project will submit an updated exit strategy.

13. Darwin identity

Efforts are made to promote the Darwin Initiative at every opportunity, and to as wide an audience as possible. The Darwin logo has been included on the published educational comic book (Indicator 2.5), which will be distributed during PY3 amongst the target communities, non-target communities and project partners. Members of each Fisheries Management Committee were provided with t-shirts, which included the Darwin logo (Annex 18)

The Darwin Initiative has been recognised as the sole funder of the project, and SEED has used the project as a platform to contribute to more national-level discussions, such as through MIHARI. The Darwin logo is included in all presentations and posters to promote the Initiative to relevant stakeholders nationally and internationally (Annex 40). Darwin was also acknowledged as the funder for the publication in the scientific journal, *Marine Policy*.

[a] https://risingfromthedepths.com/reharbouringheritage/

SEED continues to regularly link the Darwin Initiative on our monthly newsletter, highlighting the expansion of this project as a direct result of Darwin funding. SEED has over 14,500 followers across Instagram[b], Twitter[c], and Facebook[d], and shares posts on all three social media platforms to highlight the work achieved by the project. In addition, the Darwin Initiative is credited on the project website[e] including a link to the Darwin Initiative website.

14. Safeguarding

SEED believes that a thorough and transparent Safeguarding Framework is fundamental to operating ethically and ensuring that all children and adults who come into contact with its representatives have a positive experience, free from harm and/or abuse. To ensure that this happens throughout the design, implementation, management, and monitoring of projects, SEED has policies and procedures in place. These are integrated into the Safeguarding Framework, which covers all forms of abuse, bullying, harassment, and exploitation.

SEED has policies and procedures in place for safeguarding at risk children, young adults, and vulnerable adults. The following of SEED's policies and procedures also explicitly cover safeguarding: recruitment and selection, complaints and grievances, whistleblowing, disciplinary procedures, and anti-bribery and corruption. Trainings and refresher trainings for safeguarding take place across the organisation, including work on harassment and reporting. Safeguarding is explicitly referenced in staff and volunteer contracts and staff and volunteers are held to the organisation's Code of Conduct.

SEED has a reporting protocol and a safeguarding incident register. Any instances, or possibility of instances, must be reported; will be investigated through disciplinary or safeguarding routes; and may lead to sanctions, dismissal, and/or reporting to the authorities. SEED has two Trustees who are responsible for safeguarding across the organisation, as well as a Designated Safeguarding Officer. Annual reports are compiled for the Annual General Meeting of the Board of Trustees, which cover each section of the Safeguarding Framework.

15. Project expenditure

Table 1: Project expenditure during the reporting period (1 April 2019 – 31 March 2020)

Project spend (indicative) since last annual report	2019/20 Grant (£)	2019/20 Total Darwin Costs (£)	Var. %	Comments (please explain significant variances)
Staff costs				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items				
Monitoring & Evaluation (M&E)				
Others				
TOTAL	**96,378**	**90,146.08**		

[b] https://www.instagram.com/seedmadagascar/
[c] https://twitter.com/SEEDMadagascar
[d] https://www.facebook.com/SEEDMadagascar/
[e] https://madagascar.co.uk/projects/sustainable-livelihoods/oratsimba

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