



A Report for

PROJECT ORATSIMBA

Midline Progress Assessment

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1 Executive Summary

Since 2013, Project Oratsimba has supported impoverished small-scale lobster fishing communities in southeast Madagascar to establish Locally Managed Marine Areas (LMMAs). A midline assessment was conducted in the three target communities to assess progress towards project success indicators related to involvement in unsustainable livelihood practices, zebu ownership, *pirogue* ownership, knowledge of national lobster fishery regulations and, gender and project involvement. Additionally, in Sainte Luce, knowledge of local fisheries regulations and gender and involvement in fisheries management decision-making was also assessed. 267 households across the three target communities were surveyed between November and December 2019. In all three communities lobster fishing has remained a primary source of income, the number of lobster fishers has remained constant, knowledge of all three national lobster fishery regulations combined has increased and involvement in the sale of shark meat or fins, the sale of charcoal, firewood or timber and involvement in mosquito net river fishing has decreased. Household ownership of zebu has increased in Sainte Luce but decreased in Elodrato and Itapera. *Pirogue* ownership has decreased in all communities. Project awareness and event attendance is higher for men than women. In Sainte Luce, households reported less involvement in unsustainable livelihoods during No Take Zone (NTZ) closures and knowledge of local regulations was high but support for a permanent NTZ was low. The results presented in this report will be used to inform the ongoing implementation of Project Oratsimba Phase III.

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2 Introduction

Project Oratsimba Phase III, a community-based fisheries management project funded by the [Darwin Initiative](#), has been working with three impoverished small-scale lobster fishing communities in southeast Madagascar since 2013. Project Oratsimba supports the communities of Elodrato, Itapera and Sainte Luce to establish Locally Managed Marine Areas (LMMAs) with periodic No Take Zones (NTZs) as a management measure. Since Phase III began in July 2018 notable achievements include:

- i) Legal ratification of the Sainte Luce *dina* (local law).
- ii) Sainte Luce Fisheries Management Committee re-election.
- iii) Elodrato Fisheries Management Committee establishment.
- iv) Fishers association membership registration.
- v) Training of female Marine Ambassadors to deliver women's education sessions.

Since the baseline, the community of Itapera has rejected the idea of an NTZ due to conflicts within the community between the fishers choice of gear (pot users vs free-divers) and between resident and long-term migrant fishers. This has highlighted the need to adapt the community-based model, successfully piloted in Sainte Luce, based on the local context. Itapera differs from Sainte Luce in the following: community demographics, increased household poverty levels, decreased household wealth and different gears used for lobster fishing (Savage, 2020). Lack of community cohesion undermines the effectiveness of community-based fisheries management (Alexander, Bodin, & Barnes, 2018) and will impact on associated management measures (including NTZs). Therefore, Project Oratsimba Phase III is no longer promoting a periodic NTZ as a management measure in Itapera but is instead focussing on increasing community-wide support for community-based fisheries management. In Elodrato, progress in an LMMA with an NTZ has been slower than expected but the community remain engaged.

This report provides a midline assessment of progress towards project indicators related to involvement in unsustainable livelihood practices, zebu and *pirogue* ownership, knowledge of national lobster fishery regulations and, gender and project awareness and involvement. Additionally in Sainte Luce, the only community with a functioning LMMA and associated *dina* (local customary law, which became ratified prior to surveying in September 2019), knowledge of local fisheries regulations, unsustainable livelihood practices during NTZ closures and gender and involvement in fisheries management decision-making and support for a permanent NTZ was also assessed.

3 Methods

This study adhered to SEED's Human Research Code of Ethics. Participation was voluntary and informed consent was obtained verbally due to low levels of literacy.

3.1 Study Sites

This study was conducted in the three target communities involved in Project Oratsimba Phase III: Elodrato, Itapera and Sainte Luce (Figure 1). Detailed information about these communities can be found in the baseline socioeconomic assessment (Savage, 2020).

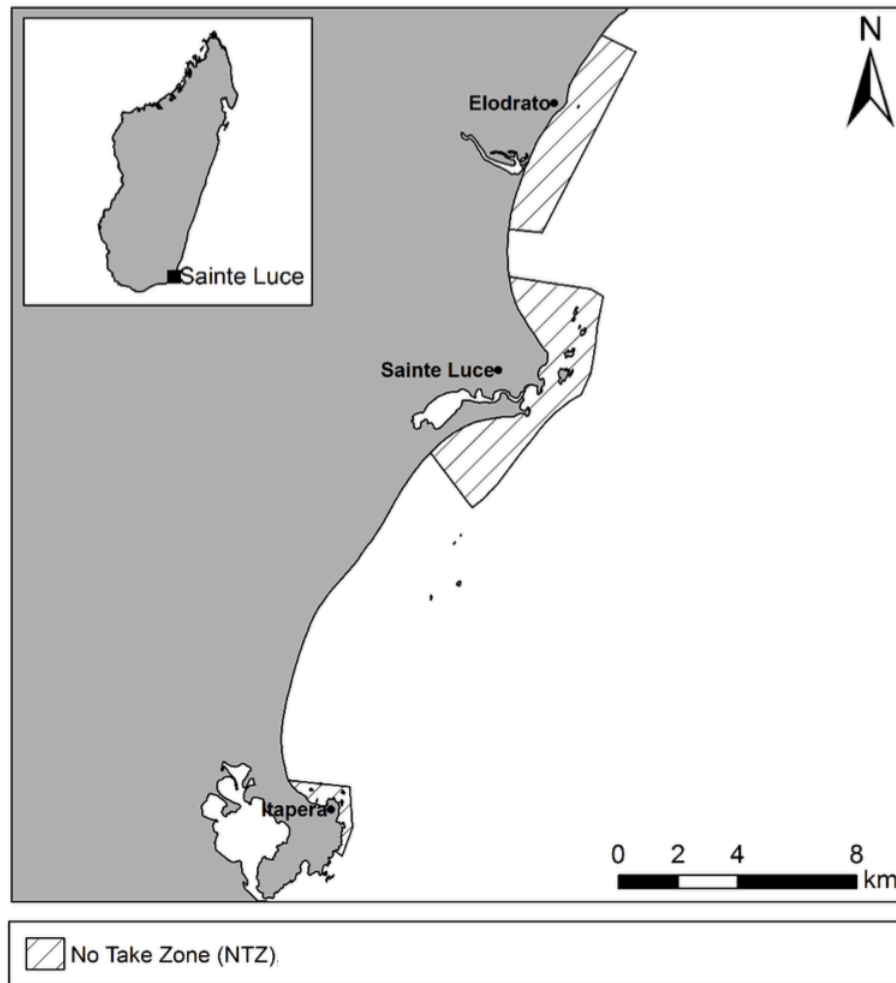


Figure 1. Location of the three target communities Elodrato, Itapera and Sainte Luce showing NTZs mapped during Project Oratsimba Phase I and II. The NTZs of Elodrato and Itapera have not been operational during Phase III so far.

3.2 Survey Design and Distribution

The household survey collected quantitative data to monitor midline progress towards indicators used in the baseline on livelihood practices, zebu and *pirogue* ownership, gender and project involvement and knowledge of national fisheries regulations. In Sainte Luce, the only community with a functioning LMMA and associated *dina*, data was also collected on knowledge of local fisheries regulations, unsustainable livelihood practices during NTZ closures and involvement in fisheries management decision-making and support for a permanent NTZ. Survey distribution followed that used in the baseline assessment (Savage 2020). To effectively monitor progress towards project indicators in Elodrato, where only 54.7% of households during the baseline were involved in lobster fishing, sampling was less random during the midline and lobster fishing households were deliberately targeted.

4 Results

The data presented in this report is the result of 267 household surveys conducted between November and December 2019 across the three target communities. The aim was to survey 100 households in each community however the actual number of households surveyed depended on the population and time available for surveying. In each community, it was estimated that at least 10.0% of households were surveyed, based on population estimates provided by community leaders. In Elodrato, lobster fishing households were more targeted accounting for the higher number of lobster fishing households surveyed during the midline. This does not necessarily represent an increase in the total number of lobster fishing households in the community (Table 1).

Table 1. Household surveys conducted by community (n=267).

	Elodrato	Itapera	Sainte Luce
Households surveyed	96	73	98
Proportion of sample (%)	36.0	27.3	36.7
Lobster fishing households (%)	88.5	89.0	88.8
Households in community surveyed (%)	10.5	26.9	10.4

4.1 Participant Demographic Characteristics

Participant demographic characteristics by community are provided in Table 2. Overall, 82.8% of participants were heads of household, 37.1% were female and 56.6% were active fishers. The mean age of participants was 37.5 ± 13.4 with a minimum of 18.0 (only adults over the age of 18 were surveyed) and a maximum of 80.0. 17.2% of participants had no formal education, ranging from 8.2% in Sainte Luce to 24.7% in Itapera. 49.1% of participants had completed primary school ranging from 41.1% in Itapera to 59.2% in Sainte Luce.

Table 2. Participant demographic characteristics (sd is standard deviation, n=267, except age n=265).

	Elodrato	Itapera	Sainte Luce
Head of household (%)	80.2	84.9	83.7
Female (%)	37.5	28.8	57.1
Active fisher (%)	55.2	64.4	52.0
Age (mean \pm sd)	24.6 ± 3.7	55.0 ± 9.4	37.6 ± 4.7
No formal education (%)	20.8	24.7	8.2
Completion of primary school (%)	43.8	41.1	59.2

4.2 Fishers Association Membership

The number of active lobster fishers per lobster fishing household remained approximately constant in all three communities from the baseline. The majority of fisher participants in all three communities were members of a fisher's association ranging from 68.0% in Sainte Luce to 72.3% in Itapera (Table 3).

Table 3. Active lobster fishers and association membership.

	Baseline (n=198)			Midline (n=232 and n=150)		
	Elodrato	Itapera	Sainte Luce	Elodrato	Itapera	Sainte Luce
Active fishers per household (mean±sd)	1.4±0.9	1.6±1.1	1.5±0.9	1.5±1.1	1.7±1.1	1.7±1.1
Fisher participant association membership (%)	NA	NA	NA	69.8	72.3	68.0

4.3 Lobster Fishing Household Livelihoods

Lobster fishing has remained the most important income generating activity for the majority of lobster fishing households in all three communities. The percentage of households reporting lobster fishing as the most important income generating activity increased since the baseline in Sainte Luce by 28.1 percentage points and Elodrato by 14.0 percentage points and decreased by 7.7 percentage points in Itapera. In the midline survey, participants were also asked if their household had sufficient income during lobster fishery closures including the national lobster closed season in all communities and NTZ closures in Sainte Luce. Elodrato had the lowest percentage of households by far with sufficient income during lobster fishery closures (31.7%) and Sainte Luce had the highest percentage of households (60.0%, Table 4).

Table 4. Importance of lobster fishing for household income generation.

	Baseline (n=198)			Midline (n=232)		
	Elodrato	Itapera	Sainte Luce	Elodrato	Itapera	Sainte Luce
Lobster fishing most important income generating activity (%)	75.0	80.0	69.5	89.0	72.3	97.6
Sufficient household income during lobster fishery closures (%)	NA	NA	NA	31.7	53.8	60.0

4.4 Unsustainable Livelihood practices

Household participation in unsustainable livelihoods detrimental to marine, freshwater and terrestrial biodiversity was assessed by asking households about their involvement in the sale of shark meat or fins, sale of charcoal, firewood or timber, mosquito net river fishing and the consumption of bushmeat. In all three communities the sale of shark meat or fins, the sale of charcoal, firewood or timber and involvement in mosquito net river fishing decreased since the baseline survey. Consumption of bushmeat decreased in Elodrato and Sainte Luce but increased in Itapera (Table 5).

Table 5. Households (%) participating in marine, freshwater and terrestrial unsustainable livelihood practices. Responses where participants were unsure if their household was involved in one or more activities were removed.

	Baseline (n=259)			Midline (n=261)		
	Elodrato	Itapera	Sainte Luce	Elodrato	Itapera	Sainte Luce
Sale of shark meat or fins	34.4	54.2	59.8	31.2	50.0	57.3
Sale of charcoal, firewood or timber	22.2	31.9	37.1	21.5	23.6	25.0
Involvement in mosquito net fishing	20.0	45.8	40.2	15.1	41.2	36.5
Consumption of bushmeat	3.3	4.2	6.2	2.2	8.3	1.0

4.4.1 Unsustainable Livelihood Practices and NTZ Closures (Sainte Luce)

In Sainte Luce, household involvement in unsustainable livelihood practices (the sale of shark meat or fins, the sale of charcoal, firewood and timber and involvement in river freshwater mosquito net fishing), during NTZ closures was also assessed by asking households if they undertook a practice more or less during NTZ closures. For all three livelihoods, households reported less involvement during NTZ closures from the baseline to the midline. The percentage of households that reported practicing the activity more during NTZ closures decreased by 22.5 percentage points for mosquito net fishing, 13.4 percentage points for selling charcoal, firewood and timber and 1.4 percentage points for selling shark fins meat or fins. The percentage of households that reported practising the activity less during NTZ closures increased by 16.7 percentage points for mosquito net fishing, 12.3 percentage points for selling charcoal, firewood and timber and 3.6 percentage points for selling shark meat or fins (Table 6).

Table 6. Household participation (%) in in marine, freshwater and terrestrial unsustainable livelihood practices during NTZ closures. Responses where participants were unsure if their household was involved in one or more activities were removed.

		Baseline (n=73)	Midline (n=95)
Sale of shark meat or fins	Less	52.0	55.6
	Same	4.0	1.9
	More	44.0	42.6
Sale of charcoal, firewood or timber	Less	28.6	40.9
	Same	3.6	4.5
	More	67.9	54.5
Involvement in mosquito net fishing	Less	15.7	32.4
	Same	3.1	8.8
	More	81.3	58.8

4.5 Zebu Ownership

Zebu, a type of indicine cattle, are used as an informal banking system with households using zebu as a way of storing wealth for future expenses. Project Oratsimba is piloting zebu ownership as a contextually appropriate indicator of wealth. In Elodrato and Itapera, the percentage of lobster fishing households owning zebu and the mean number of zebu owned decreased from the baseline to the midline. Percentage household ownership decreased by 17.5 percentage points in Elodrato and 7.6 percentage points in Itapera. Mean household ownership decreased by 0.9 in Elodrato and 0.1 in Itapera. In Sainte Luce, percentage household ownership of zebu increased by 3.5 percentage points and mean household ownership has increased by 0.3 (Table 7).

Table 7. Lobster fishing household zebu ownership by community (sd is standard deviation).

	Baseline (n=198)			Midline (n=232)		
	Elodrato	Itapera	Sainte Luce	Elodrato	Itapera	Sainte Luce
Household ownership (%)	57.7	23.0	30.6	40.2	15.4	34.1
Household ownership (mean \pm sd)	2.4 (\pm 3.5)	0.6 (\pm 1.4)	0.9 (\pm 2.3)	1.3(\pm 2.6)	0.5(\pm 2.0)	1.2(\pm 2.3)

4.5.1 Historical Zebu Ownership

In all three communities, the percentage of lobster fishing households that reported owning zebu was highest in 2014 and decreased between 2014 and 2019. Between 2009 and 2014, in Elodrato and Sainte Luce household reported zebu ownership decreased but remained approximately constant in Itapera. Over this time period, Elodrato had the highest reported household zebu ownership (Table 8). The number of zebu owned has decreased over time. In Elodrato and Itapera the majority of households owned less zebu in 2019 compared to 2014 and 2009. In Sainte Luce the majority of households owned less zebu in 2019 compared to 2009 but only half of households owned less zebu in 2019 compared to 2014 (Table 9).

Table 8. Lobster fishing household zebu ownership between 2009 and 2019 (midline) (n=232, except 2014 n=231).

		Elodrato	Itapera	Sainte Luce
Household ownership (%)	2019	40.2	15.4	34.1
	2014	63.4	34.4	41.2
	2009	43.9	33.8	31.8

Table 9. Comparison of the number of zebu owned by lobster fishing households over time (n=108 for 2014, n=84 for 2009).

		Elodrato	Itapera	Sainte Luce
Number of zebu owned in 2019 compared to 2014 (% of households)	Less	76.9	95.5	50.0
	Same	11.5	4.5	14.7
	More	11.5	0.0	35.3
Number of zebu owned in 2019 compared to 2009 (% of households)	Less	80.0	90.9	63.0
	Same	5.7	0.0	11.1
	More	14.3	9.1	26.0

4.6 Pirogue Ownership

As part of efforts to ensure the economic viability of the lobster fishery, household *pirogue* (wooden dugout canoe) ownership is being monitored throughout Project Oratsimba Phase III. Fishers fishing from a *pirogue* they own themselves are not restricted in who they can sell their catch to and obtain a higher price per kilogram of lobsters compared to fishers who fish from a *pirogue* owned by a buyer (*rabbateur* or *collecteur*). In all three communities, the percentage of lobster fishing households owning pirogues decreased from the baseline. The biggest decrease was observed in Itapera by 17.0 percentage points, followed by 10.8 percentage points in Sainte Luce and 5.2 percentage points in Elodrato (Table 10). 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 (SEED Madagascar, 2018). Self-reported *pirogue* ownership used in the baseline and midline may therefore be over reported.

Table 10. Lobster fishing household pirogue ownership.

	Baseline (n=198)			Midline (n=232)		
	Elodrato	Itapera	Sainte Luce	Elodrato	Itapera	Sainte Luce
Household ownership (%)	13.7	32.4	40.2	8.5	15.4	29.4

4.7 Knowledge of National Fisheries Regulations

Knowledge of the three main national lobster fishery regulations was assessed;

- i) The national closed season for lobsters occurs yearly between January 1st and March 31st inclusive, during which time it is illegal to fish for lobsters throughout Madagascar. Participants were asked if fishing for lobster between January and March is allowed.
- ii) The prohibition on landing berried females prohibits bringing berried (egg bearing female) lobsters back to shore. Participants were shown a picture of a berried lobster and asked if they caught the lobster would they bring it back to shore.
- iii) The minimum landing size of 20cm is the legal minimum landing size (MLS) for lobsters caught to be bought back to shore. Participants were randomly shown one of four pictures of varying sizes of lobsters (10cm, 14cm, 18cm, and 20cm) and asked if they caught the lobster would they bring it back to shore.

11 participants were unwilling or unable to answer questions about one or more of the national lobster fishery regulations during the midline survey. In all three communities, the percentage of participants with correct knowledge of all three national lobster fishery regulations increased from the baseline but still remained low. The biggest increase was by 8.7 percentage points in Elodrato followed by 4.7 percentage points in Sainte Luce and 2.1 percentage points in Itapera. Whilst correct knowledge of all three national regulations increased, correct knowledge of individual regulations varied. The prohibition on landing berried females was the only regulation in which the percentage of participants with correct knowledge increased in all three communities and was the regulation with the biggest increase observed in all three communities; by 41.8 percentage points in Elodrato,

30.9 percentage points in Sainte Luce and 11.3 percentage points in Itapera. Knowledge of the national closed season increased by 1.7 percentage points in Elodrato and 0.7 percentage points in Itapera but decreased by 27.1 percentage points in Sainte Luce. Knowledge of the minimum landing size decreased in all three communities, the biggest decrease was observed in Sainte Luce by 30.9 percentage points, followed by 3.9 percentage points in Elodrato and 3.0 percentage points in Itapera (Table 11).

Table 11. Participants (%) demonstrating correct knowledge of national fisheries regulations, participants that did not answer one or more questions are excluded.

	Baseline (n=245)			Midline (n=256)		
	Elodrato	Itapera	Sainte Luce	Elodrato	Itapera	Sainte Luce
All three national regulations	33.3	26.1	38.6	42.0	28.2	43.3
National closed season	73.3	76.8	93.1	75.0	77.5	66.0
Minimum landing size	65.3	55.1	74.3	61.4	52.1	60.8
Prohibition on landing berried females	40.0	46.4	50.5	81.8	57.7	81.4

4.8 Knowledge of Local Fisheries Regulations (Sainte Luce)

At the time of surveying, Sainte Luce was the only community with a functioning LMMA and associated *dina* (local customary law) which since the baseline survey had become legally ratified in September 2019. Knowledge of two regulations contained within the *dina* was assessed;

- i) Knowledge on the prohibition of using a mask and snorkel for fishing was assessed by asking participants whether it is permitted to fish using a mask and snorkel in Sainte Luce.
- ii) Knowledge of NTZ closures was assessed by asking participants whether fishing was permitted in the second NTZ closure period of 2019 (November and December).

All participants were able to answer questions about local regulations and knowledge of the two regulations was high. Correct knowledge on the prohibition on fishing with a mask and snorkel remained high with almost all participants having correct knowledge, increasing by 1.9 percentage points to 99.0% of participants. Correct knowledge of a current NTZ closure increased by 76.0 percentage points to 87.8% of participants (Table 12). The newly elected Fisheries Management Committee decided immediately prior to surveying to re-open the NTZ for the remainder of November and December 2019 due to an increase in NTZ infractions and lack of capacity within the committee despite it being the first NTZ closure since the *dina* became legally ratified. Therefore, correct knowledge of this regulation differed between the midline and baseline.

Table 12. Participants (%) demonstrating correct knowledge of local fisheries regulations in Sainte Luce.

	Baseline (n=102)	Midline (n=98)
Prohibition on fishing with a mask and snorkel	97.1	99.0
Upcoming or current NTZ closure	11.8	87.8

4.8.1 Support for Permanent No Take Zone

The economic benefits from NTZ closures will create powerful economic incentives for long-term LMMA management. Project Oratsimba Phase III will use this to catalyse engagement with fisheries management and aims to establish conditions within Sainte Luce for a permanently closed NTZ (permanent marine reserve). The midline survey was the first assessment of community-wide support for a permanent NTZ and asked participants about their level of support for having an area of the NTZ where it is not allowed to fish for lobsters and would be closed permanently all year. Support for a permanent NTZ in Sainte Luce was low, with 78.6% of participants showing no support (Table 13).

Table 13. Sainte Luce community support for a permanent NTZ.

	Midline (n=98)
Full support (%)	18.4
Some support (%)	3.1
No support (%)	78.6

4.9 Gender and Involvement

Deeply entrenched socio-cultural traditions in community structures and decision-making systems undermine women's engagement with fisheries and other natural resource management in the three target communities. Whilst the actual fishing of lobster is carried out exclusively by men, women carry out other tasks to enable lobster fishing such as the collecting of bait and weaving of lobster pots. Failing to include women in fisheries management weakens decision making, reduces community ownership (Westerman & Benbow, 2013) and undermines compliance with management measures (Agarwal, 2000). In the three target communities, participant awareness of Project Oratsimba and self-reported attendance at lobster fisheries management events in the past year was monitored.

In all three communities, awareness of Project Oratsimba was low and was lower for women. The difference in reported awareness between genders was highest in Sainte Luce with 21.4% more men aware of the project, followed by 21.2% in Elodrato and 16.5% in Itapera. Self-reported attendance at events was higher than project awareness for men and women in each community. The difference in reported attendance between genders is highest in Elodrato with 30.0% more men attending project events, followed by 22.4% in Itapera and 19.6% in Sainte Luce. Sainte Luce is the community with the highest project awareness and event attendance (Table 14).

Table 14. Gender and project awareness and involvement by community (n=267).

	Elodrato		Itapera		Sainte Luce	
	Men	Women	Men	Women	Men	Women
Project awareness (%)	35.0	13.8	30.8	14.3	64.3	42.9
Event attendance (%)	55.0	25.0	46.2	23.8	83.9	64.3

4.9.1 Gender and Involvement in Decision-Making (Sainte Luce)

In Sainte Luce, awareness of and involvement in lobster fisheries management decision-making was also monitored. For both men and women, there was broad awareness of decisions made but awareness was lower by 13.6% for women. The percentage of both men and women reporting involvement in decision-making decreased from the baseline. The difference in reported involvement in decision-making between genders increased from the baseline (37.5%) to the midline (41.8%) (Table 15).

Table 15. Gender and decision-making awareness and involvement in Sainte Luce.

		Baseline (n=102)	Midline (n=97)
Aware of decision-making	Men (%)	NA	94.6
	Women (%)	NA	81.0
Involvement in decision making	Men (%)	88.4	85.7
	Women (%)	50.9	43.9

5 Summary

The results from this report act as a measure of progress towards project success indicators. Progress so far includes; reduction of household involvement in unsustainable livelihoods (with the exception of bushmeat consumption in Itapera) and fishers association membership registration in all three communities and increased household zebu ownership and knowledge of local fisheries regulations and decreased household involvement in unsustainable livelihood practices during NTZ closures in Sainte Luce.

Bushmeat consumption has slightly increased in Itapera possibly related to food insecurity which was reported as a reason for a lack of NTZ support. Long-term food security is addressed through decreasing poverty levels and increasing fishing household incomes following NTZ openings. Short-term food security during NTZ closures and the national closed season are out of the scope of Project Oratsimba Phase III. This further supports moving away from promoting an NTZ in Itapera. Increased household zebu ownership in Sainte Luce is likely to be an effect of increased household income and wealth following NTZ openings, although it should be noted that since the baseline there has only been one full NTZ closure. Progress in establishing an NTZ in Elodrato has been slower than anticipated and the economic impacts will only be evident once an NTZ has been established. *Pirogue* ownership has decreased in all three communities and this remains a threat to the economic viability of the fishery. Financial literacy training in Elodrato and Sainte Luce is ongoing and will strengthen household economic resilience and encourage investment from increased income following NTZ openings in locally appropriate assets, such as zebu and *pirogues*. National fisheries regulation knowledge remained low. Increasing knowledge and awareness of national regulations is crucial to increasing compliance with national regulations poorly enforced by the state which will in turn, along with local regulations, improve the sustainability of the lobster fishery. Community, women-only and youth education sessions on national regulations will be continued throughout the remainder of the project. Support for a permanent NTZ in Sainte Luce was low. It is hoped that the economic benefits from NTZ closures and project activities including capacity building, mass mobilisation and cross-visits to LMMAs on the southwest coast will create powerful economic incentives and increase support for a permanent NTZ. Gender disparity is evident in project awareness and event attendance and in Sainte Luce in involvement in decision-making. This is recognised as an on-going challenge. The training of female Marine Ambassadors to deliver women only education sessions will play a vital role in empowering women to become more involved in community-based fisheries management. The results presented in this report will be used to inform the ongoing implementation of Project Oratsimba Phase III.

Acknowledgements

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