



3rd
Annual
Report

01 January 2016 – 31 December 2016

2016

Mahakam Delta Integrated Management Program

(MADIMAP)

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A- Executive summary

Project background

The Mahakam Delta is located at the mouth of the Mahakam River in East Kalimantan province and was originally covered with dense Nypa forest of about 60 000 hectares which represented one of the largest Nypa in the world. However, the population of the mangrove in the delta was severely deforested due to several factors particularly the expansion of the shrimp aquaculture ponds. Between 1996 to 1999 only, for instance, it is estimated that 41,500 ha of mangroves (equivalent to 415 km²) have disappeared because of new ponds openings, while since the beginning of the 1970s, it could be 60 to 80% of the entire surface of the delta surface area that has been deforested. As the consequence, the balance of the ecological system is highly disturbed which led to the delta ecosystem degradation. It further degrades the environment quality and the population's economic and social system.

Taking the consideration of the critical role of the delta to the lives of the local population as well as to the balance of the ecological system, many actors turned their attention to implement the ecosystem restoration through the mangrove reforestation programs. The local authorities estimate that 66% of the delta should be covered by natural vegetation in order to maintain the essential environmental services provided by mangrove forests. Various actors from local authorities, NGO, governments, universities, to local communities had taken the initiative to replant the mangrove in their respective working areas. However, lack of coordination among actors in the area caused the difficulties to access the available information to having a global vision of the ecosystem restoration program. Each actor developed their respective methodology in certain area without sharing information mechanism leading to the overlapped activities, ineffective and inefficient program implementation.

In the objective to manage the delta's ecosystem in a more sustainable, effective and efficient way, the local authorities had developed several strategies. First, the Forestry ministry had established a productive forestry management unit (KPH Delta Mahakam) responsible to the management of the delta. Its main task is to develop the long term strategic plan on the sustainable delta management. The strategic plan was already developed and approved to be implemented from 2017. The plan was established as the reference for actors interested to implement the ecosystem restoration program in the area. In this respect, Planete Urgence developed the reforestation strategic plan of 2017 based on the plan and coordinates closely with local authorities in order to keep the coherence of the project to the local authorities programs.

The Planete Urgence Indonesia strategic plan for 2017 is developed as the result of the lesson learnt from MADIMAP project to contribute to the more integrated ecosystem restoration coordinated by the local authorities to the benefit of the vulnerable population. In that sense, the

organization continues to work in the Mahakam delta restoration while expanding the working area into the southern part of the delta and the other areas linked with the Mahakam river ecosystem. Beside, the new strategy includes the more development of the relation and the coordination with the actors working on the environment and climate change issue in the delta and the province in general. The strengthened relation with national authorities (ICCTF), DDPI (Provincial council on climate change), the ministry of forestry, the local authorities in the sub district and the village level, the INGO and donors working in east Kalimantan, Academics from Mulawarman universities and forest research center, the potential local partners both for STVA and ED programs, as well as the private sectors (Total, Vico) is on the priority in the 2017 strategic plan.

Program performance

Quantitatively, the project objectives achievement reached 98,10 % during the three years implementation from 2014-2016 (see the matrix of objective achievement). The highlight will be on the year of 2016 in which the project team was able to accelerate the implementation due to the lesson learnt drawn from the previous two years project implementation.

On the first objective, the achievement could be seen from the scale up activities of the raising awareness on the important of mangroves and the environment conservation, the plantation of 59 000 trees to accomplish the objective of 360,000 trees plantation for three years, and the establishment of the carbon sequestration monitoring as well as the newly established carbon storage baseline.

As for the second objective achievement, the establishment of 57 hectares of sustainable aquaculture ponds to reach the total 155 hectares ponds benefiting 37 beneficiaries during the three years of implementation.

Besides, the project had also extended its support for beneficiaries to access the financial capital trough the continuous accompaniment on the microcredit groups so called Self Help Groups (SHG). Total credit of IDR 229,000,000 (about 16,357 EURO) was disbursed in 2016 for the benefit of 119 micro projects managed mostly by women in the project intervention area. All those achievement went hand in hand with the capacity building activities which took its peak in 2016 both for the project beneficiaries and for local partner of Yayasan Mangrove Lestari. The trainings, accompaniments, and auditing activities were organized in the villages aiming to improve the capacity of the beneficiaries on the microcredit managements, sustainable aquaculture technique, plantation, as well as organization managements. 4 STVA volunteers were assigned in 2016 on simple booking and marketing to support the capacity building activities of the local partners and the project beneficiaries to reach 10 volunteers in total during the project implementation. Furthermore, the project had intensified the capacity building improvement for YML staffs on project management and technical skills in order to enable them to managing the environment conservation more autonomously after the project. The intensive intervention on the capacity building activities showed quite positive impacts to the project objective, particularly on the qualitative aspects. The first highlight will be on the increase of the

women and young generation participation on the project implementation on the reforestation and microcredit activities. Furthermore, the project management skills of YML staffs had also been improved on the last year of implementation. It could be seen from the activities implementation acceleration, the more accountable financial report, the improved HR and administration management, as well as the better project database management.

In order to strengthen and sustain these impacts, Planete Urgence plans to continue the intervention in the project area while expanding the program to the southern part of the delta and other areas in the province.

B – Description of activities for the year 2016:

SO1: Protect and restore the ecosystems to preserve the biodiversity and the environmental services and goods they provide

- **Expected Result 1.1: Local populations and actors are made aware of the importance of protecting the environment and are trained in innovative reforestation techniques**

Activity 1.1.1: The awareness of local populations, authorities and other key stakeholders on environmental protection and natural resources management is raised

The awareness of the local population to the important benefit of the delta's ecosystem restoration for their lives is one of the crucial points of every restoration program in the delta. It will increase the active participation of them to be involved in the project implementation process; therefore, will sustain the positive impacts after the termination of the project. In this respect, the project continued putting the raising awareness on the priorities to be conducted in 2016 aiming to increase the understanding of the beneficiaries as well as to target more beneficiaries group living in the project intervention area. On one hand, the aquaculture producers remain the main target of the activities in order to change their unsustainable aquaculture cultivation which damages the mangrove forest and contaminating the ecosystem. On the other hand, the project considered to increase the awareness of young generation on the importance of mangrove to the environment as well as their lives. During the project coverage report, the project team conducted interactive socialization activities in 7 schools in the project area targeting students from elementary to high schools. The students were encouraged to have the direct experiences on the environment conservation by involving them to the plantation activities in their respective villages. They found the activities very interesting because they can participate to protect the environment in a very fun way.



Picture 1: School children participation to plant mangrove in Tadutan

The increase of the communities' awareness which was achieved through the intervention of the project is a positive sign to the sustainability of the project impact. However, it will remain only to small groups of beneficiaries in the project intervention areas and could be decreased or even disappeared without any long terms strategy. In this sense, the project conducted as well the project promotion and socialization to the related local stakeholders including the environmental and development NGOs, local authorities, local civil societies, and private sectors in order to scale up the project impact on the awareness raisings. The project team conducted regular meetings with the stakeholders in order to promote the project, to coordinate the activities, to share information, and to strengthen the networks. The acceptance of the local stakeholders to the project are very positive considering that

MADIMAP project worked on the field with a high coherence and relevance to the local government development objectives. The year of 2016 could be highlighted as an important period for the project to strengthen the link of coordination with the local actors as Planete Urgence was appointed as the official partner of the DDPI (Provincial council for climate change). It is worth mentioning in this report that the local governments appreciate the project implementation yet increase the supports from the Board of the development planning, the ministry of forestry, the local research centers, and related development to the implementation as well as the continuation of the project.

“Your project activity which is very well linked to the reforestation in the critical zones is very important. It fits perfectly with the government framework.” (Local authority, Kutai Kartanegara)

The following table shows the number of activities conducted in order to achieve this expected result:

Table 2: Number of raising awareness activities

Activity	Quantity		Participants		
	Target	Achieved	Female	Male	Total
1. Raising awareness to community	6	6	16	61	77
2. Raising awareness to schools students	7	7	102	96	198
3. Coordination with local stakeholders	1	6			
4. Inter actors meetings	2	3	11	52	63

The materials of information, education, and communication were also produced and distributed in order to support the effort of improving beneficiaries' knowledge on the ecosystem restoration actions including the topics of mangrove benefits and sustainable aquacultures. The media of the communications includes posters, banners, stickers, and calendars.



*Picture 2:
IEC Material distribution*

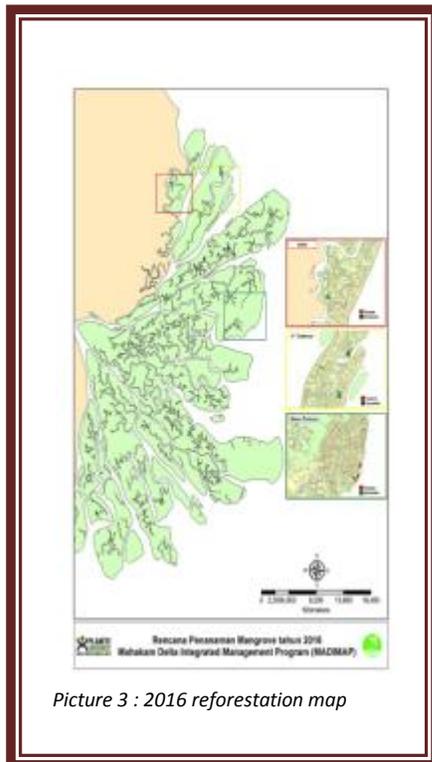
Activity 1.1.2: One good practice guidebook on mangrove reforestation is published and distributed to local authorities and populations at the project's sites

As the awareness of the local population has already risen by the previous activities, the project followed it with the distribution of technical guidebook on mangrove reforestation in order to improve the skills of the project beneficiaries to plant mangroves in their villages. 100 exemplars of guidebook is printed and distributed during the report period to the new project beneficiaries as their reference to the reforestation activities including the selection of good mangrove propagules, seedling maintenance in the nurseries, as well as the appropriate method to plant mangroves.

– **Expected Result 1.2: Priority natural sites of interest are identified and restored**

Activity 1.2.1: Three strategic reforestation plans are drafted

The development of the reforestation plan is an annual activity to be conducted in order to prepare the plantation including that of 2016. The project team conducted the discussion with the communities to identify the potential sites for the reforestation including the area at risk, active ponds and inactive ponds. The information collected during the identification was the land coverage, the land ownership, the sites coordinates, as well as the willingness of the owner to plant mangroves. Furthermore, the project team will also identify the propagules availability and season in the area in order to meet the plantation target. Following the information collection, the project team will develop the plantation plan consisted the information of the planned plantation plots, the total trees in every sites, as well as the schedule and budget of the plantation. The



Picture 3 : 2016 reforestation map

project team conducted the final visit to verify all the information before the beginning of the tree planting activity. Upon the collection of site coordinates, the project hired a mapping consultant to update the reforestation map. It was then printed to be distributed to the beneficiaries and the local stakeholders.

Activity 1.2.2: The most vulnerable areas to the effects of climate change are reforested

The plantation of 50 000 trees were planted in November and December 2016 at the risky zones in the 3 villages of intervention. It was aimed to establish the green belt in order to protect the community, their houses, their economic assets, and their lives from the erosion and extreme weathers. The mangroves were planted along the identified riverbanks and coastal area. As for the seedlings, all the trees planted in this type of land are conventional

seedling which had been kept and maintained in the nurseries for at least 3 months before being planted in the definitive sites. The community opted to plant *Rhizophora Mucronata* as the tree species because it was known for its resistance against the extreme tide. Besides, the root of this species is very well known for its ecological function to be the water filter and the media of fishes and crabs nurseries.

During the 3 years of the project implementation, 150 500 mangroves were planted in the areas at risk. The growth monitoring visit is regularly conducted following every year of plantation. The activities were done in 3 months, 6 months, and 1 year following the plantation. The objectives of the activity were to monitor the tree growth, the survival rates as well as to identify the growth problems. A beneficiaries meeting was organised following each monitoring in each villages in order to share the plantation progress of each plantation plot. Yet, the success story and the problem faced by the beneficiaries were discussed to identify the possible solution.

The monitoring result of the 2014 – 2015 plantation shows about 62% of the average survival rate after one year plantation. The monitoring for 2016 plantation will be conducted in March 2017 yet the result will be known in April 2017. Based on the monitoring report, the low survival rate of certain plot was due to the caterpillars, crab, and parasite attacks. The other problem was the extreme tide. As for the caterpillars attack, a research team from the Mulawarman University and local forestry research centre were assigned at the end of the year to visit the plantation sites in Tadutan, Muara Badak village in order to observe the problems. Based on the preliminary observation report, the intensity of the caterpillar attacks were very high in the active ponds because of the low resistance of the planted trees. Most of the mangroves planted at the active ponds are smalls and soft, therefore, the caterpillars could eat all the tree elements quicker than the bigger trees. The other condition which worsening the problem is generally slow growth of the trees in the active ponds due to the stagnant water level. A more deeper and comprehensive research is needed to identify the solution to the problem. (See the annexe of reforestation data)

– **Expected Result 1.3: The project has a significant positive impact in terms of greenhouse gas sequestration**

Activity 1.3.1: A carbon monitoring procedure of the plantations is elaborated and implemented

In the objective to enable the project team to estimate the carbon impact of the reforestation project in the delta, a team of carbon consultant was hired to set up a carbon monitoring procedure for the project. The selected consultants were the carbon researchers of the Difterokarpa research centre (Forest research centre of the Forestry ministry) in Samarinda. The carbon monitoring procedure was established by the consultant aiming to provide guideline for the project staff to monitor the carbon sequestration and storage of the planted trees in the delta. The document consists of the following information:



Pictures 4 and 5 : Field works to collect the carbon calculation data

1. Scope
2. Normative reference
3. Term and definition
4. Forest carbon measurement and calculation methods
5. Biomass measurement procedures for 3 carbon pools
6. Calculation of carbon stocks
7. Database management
8. Quality assurance and Quality control

Following the establishment of the carbon monitoring procedure, the staffs training were done in order to familiarize the calculation procedure to the field staffs. It is expected that the staffs could gain knowledge and skills to conduct the carbon monitoring and calculation autonomously in the future. The trainings were organised twice for 10 staffs of YML and Planete Urgence Indonesia. The first training was done in August 2016 to deliver the topic of forest carbon measurement and calculation methods while the second was done to train the participants on the database management.

The research team assisted by the project staffs visited the 3 villages of intervention in order to organize field works to collect the data for carbon stock estimation. 26 permanent sampling plots which represented the year of plantation as well as the plantation land types were established in order to monitor and estimate the carbon stock. The monitored trees were those planted from 2013 to 2015 plantation campaign. Based on the data analysis, 294, 8 tonnes of carbon were sequestered as the impact of the reforestation project in the area of intervention. The report included the estimation of carbon sequestration emission from 2016 to 2036. The estimation of the annual carbon sequestration is 209,990 tons/ha/year. The following table shows the total estimation of the carbon storage as the impact of the reforestation activity:

Table 3: Estimation of carbon storage in 2016

Village	Land type	Average Storage estimation (ton c/ha)	Land size (ha)	Estimation of total carbon storage
Saliki	Area at risk	6,63	12,10	78,96
	Active ponds	0,43	40,00	17,04
	Inactive ponds	3,17	26,80	84,96
M. Badak	Area at risk	0,84	5,6	4,69
	Active ponds	0,58	74,90	43,29
	Inactive ponds	1,23	29,20	36,06
M. Pantuan	Area at risk	1,23	9,70	11,91
	Active ponds	0,37	30,50	11,32
	Inactive ponds	0,47	14,00	6,54
			242,8	294,77

SO2: Support the economic development of the populations living in the Mahakam delta by encouraging the adoption of a sustainable aquasilviculture model and the promotion of alternative income-generating activities

Whereas the first specific objective targeted mainly on the ecosystem restoration, the second objective focused on the promotion of sustainable livelihood of the local population in order to strengthen their resilience to the impact of climate change and the environmental degradation.

- **Expected result 2.1: Model(s) of sustainable aquasilviculture adapted to the Mahakam delta are implemented to the benefit of the producing families of the target villages of intervention**

Activity 2.1.1: Research action activities are undertaken to elaborate well-adapted aquasilviculture models based on reforestation and the use of organic inputs

No activity was conducted in 2016 as planned.

Activity 2.1.2: Three clusters are set up to serve as demonstration plots for the sustainable aquasilviculture model(s) developed



Picture 6 : Mangrove at the active pond



Picture 7 : Shrimps production in M. Pantuan

Organic aquaculture materials were distributed for 14 beneficiaries to establish 57 hectares of sustainable aquaculture ponds. The materials distributed were organic fertilizers, chalk, fishing gears, fish and shrimp seedlings. To be noted, 73 % of the materials cost were charged to the microcredit revolving fund collected from the beneficiaries' reimbursement. During the 3 years project implementation, 155 hectares of ponds in the project area had been converted into sustainable aquaculture ponds passing the initial objective of 150 hectares.

In term of the implementation process, the project used the similar approach as that of the previous years with several necessary modifications in order to optimise the achievement of both the quantitative and qualitative objective. The raising awareness activity on the important of sustainable practice to manage the aquaculture production was conducted at the identified beneficiaries. They are the beneficiaries of the mangrove plantation at the active ponds in the previous years. The activity also targeted the potential beneficiaries in order to scale up the impact of awareness rising. The positive sign of the impact is there are more producers who came voluntarily to look for information on the benefit of mangrove to their ponds or to ask the possibility to participate to the project activity. As the following, 2 section of training were done in every village on the sustainable aquaculture technique in order to improve the skill of the local producers. The topic of the trainings were the production preparation, the water quality management, the maintenance and harvesting, as well as post harvesting management including mangrove management. Following the verification of the beneficiaries, the organic aquaculture inputs were distributed to enable them starting the production cycle. The project learnt that the long verification process as well as the unavailability of the material locally delayed the activity implementation in 2014 and 2015. In 2016, the activities were started at the beginning of the year to anticipate the delay. As the result, the objective of 2016 was achieved by the end of the year.

Table 4: Raising awareness activity for sustainable aquaculture

Activity	Quantity	Participants		
		Female	Male	Total
Raising awareness on sustainable aquaculture	9	25	143	168
Sustainable aquaculture training	6	28	78	106

Though the mangrove in the ponds experience the slow growth compared to those planted at the other plantation sites, the beneficiaries were able to observe the benefit of the mangroves to their aquaculture production. Several beneficiaries admitted that the plantation in their ponds help to increase the productivity, to reduce the shrimp diseases, as well as to improve the ponds water quality. These benefits were heard by other producers who, as the consequence, wanted to copy the model of the sustainable technique to their ponds. Mr. Abbas, a beneficiary from Muara Pantuan stated:

“The production of my ponds is almost double because of the decrease of the shrimp diseases after I planted mangroves in 2014”.

Despite the signs of the positive impacts both in term of the revolving funds implementation and mangrove benefit to the ponds, the follow up and the accompaniment are still necessary in order to sustain the project impact. It is particularly on the revolving funds management in the objective to ensure the reimbursement of their credit as well as to reach other potential beneficiaries. In this respect, the beneficiaries of the activities will be increased so then the number of the sustainably managed ponds will be larger.

Activity 2.1.3: A capitalization process on the results of the project is undertaken

6 activities were organised in order to capitalize the good practice of the sustainable aquaculture implementation in the project area. The purpose is to scale up the impact of the awareness of the indirect beneficiaries by sharing the observed benefit of the aquaculture practice which respects the environment. In order to optimize the impact of the lesson learnt sharing, the activities were divided into two stages. First, 1 (one) internal meeting was organised in each village to facilitate the discussion among the project direct beneficiaries. During the meeting, the project beneficiaries shared their experiences of managing their sustainable aquaculture production including the information of the progress of their production, the problem in implementation, and other related issues to the aquaculture production. Following the internal meeting, the project invited the direct beneficiaries to visit the ponds which showed the increase of the production due to the project intervention. The interactive discussion was organised directly on the field in order to answer the questions of the participants on the ponds management. 1 (one) field visit is organised in each village. The following table shows the total of capitalization activities in 2016:

Activity	Quantity		Participant		
	Target	Achieved	Female	Male	Total
Internal meeting	3	3	25	36	61
Field visit	3	3	0	41	41

- **Expected result 2.2: A diversification of the sources of income for the families living in the target project sites is encouraged**

Activity 2.2.1: Crab production in inactive ponds is supported

During the internal program evaluation in July 2016, the inability of the direct beneficiaries to reimburse their credit on the establishment of crab production due to several factors. Firstly, the option to set up the crab box in the inactive ponds was ineffective due to distance of the location with the farmer houses. Therefore, the cost to control the facilities was too expensive and did not worth with the income from the activity. Secondly, the motivation of the local farmer to manage crab production was lower due to the launch of the national policy on the limitation to the legal crab size for export commodity. Therefore, the project team modify the activities while maintaining the principal objective of the activity to provide the alternative income for the beneficiaries of the plantation at the inactive ponds.

The aquaculture officer organised several discussions with the beneficiaries to gather propositions on the appropriate activities. Among the propositions are the support of the sustainable aquaculture activity such as the distribution of organic material and the repairmen of pond Watergate, and the support to develop the beneficiaries' small business. 6 beneficiaries have got supports from this activity as the compensation of planting mangrove in their inactive ponds.

The project had planted the last 9,000 trees in the inactive ponds in 2016 in the 3 villages of intervention. In this respect, the project had planned 30,500 trees in the inactive ponds which surpassed the project total target of 30,000 trees. To be noted, the reforestation in the inactive ponds was aimed to rehabilitate the abandoned and destroyed ponds. Many ponds are abandoned by the owners because they are no longer productive and profitable. The causes are the infrastructures damages because of high and extreme tides as well as the decreased aquaculture productivity due to the degraded soil and water quality.

Activity 2.2.2: Processing activities of mangrove and aquaculture products are encouraged and a marketing support is provided to boost the sale of delta-sourced products

100 guidebooks on aquaculture product processing were distributed to the women groups which are mostly the wives of the aquaculture producers. It was done to improve the skills of the women in processing the aquaculture base product; therefore, it would contribute to the increase of the income generation of their families. Beside, the follow up was also conducted by the project team on the simple marketing mission which were done in 2015 by 3 volunteers in the project area. The impact evaluation was conducted at the beginning of 2017 to assess the impact of the mission to the beneficiaries' capacity on marketing. The evaluation report suggested the following impacts of the missions to the beneficiaries:

- The knowledge and skills improvement on marketing
- The improvement of the skills to build network to sell their products (fish chip, amplang)
- The increase of the beneficiaries' motivation to grow their business

“There are three women groups who make amplang (fish chips) in Saliki village. In general, our amplangs are similar, but we have little different taste of amplang; so we have our own market. Through the training I have learned networking is important to gain a broader market. In my case I develop networking through individuals. For example, I contacted the workers in company to promote our products. This have resulted more order to me and my group.” (Hj. Sudarni, micro business women, Saliki Village)

Activity 2.2.3: 6 micro-credit funds are set up and villagers are trained in small business management training

The collected microcredit capital from 2014 to 2016 reforestation reached IDR 352,500,000 or 24 950 EURO (1 EURO- 14 128 IDR). Considering that 2016 was the last year of the MADIMAP project, the team had doubled the effort to strengthen the capacity of the self help group in each village to manage their microcredit capital. In doing so, the project team facilitated the regular meeting among the committee and members. During the meeting, the

committee were closely accompanied and supervised to conduct an appropriate control mechanism of their asset. The meeting of the members were also conducted regularly in every village in order to ensure the transparency of the management as well to increase the motivation of the members. 6 meetings were organised aiming for group accompaniment while other 6 meetings were done to train the committee members on the proper microcredit management for 77 members of the group. In order to prepare the SHG in managing the microcredit autonomously, the transition strategy was done by increasing gradually the responsibility of the group while the project team kept accompanying them. At the moment, the SHG committee were accompanied to conduct credit analysis of the members, managing the cash flow, developing the database of the members, and collecting the reimbursement.

Following the marketing mission of the STVA in 2016, 4 volunteers were assigned to support the microcredit managements of the groups. The assignment of the volunteers were varies based on the context of each group, as well as the field progress. Two of the missions were organised in order to deliver the basic skills on the simple bookkeeping targeted the women groups in Muara Pantuan village and Tadutan, Muara Badak village. The other two were done in order to conduct an evaluation in order to evaluate the effectiveness and the efficiency of microcredit management as well as to support YML team to consolidate all the data related to microcredit. The report showed that the activity had the impact for the women group in the family livelihood diversification. Furthermore, the activity has a high potential to be sustained due to the punctuality of the members to reimburse the credit (95 % of reimbursement rate). After the project MADIMAP, Planete Urgence keeps the commitment to accompany the self help group on the microcredit management.



C - CONCLUSION

The year of 2016 is the last year of MADIMAP project implementation supported by Trafigura Foundation. It was so called as the pilot project because it offers a new integrated sustainable approach of restoring the Mahakam delta by strengthening the resilience of the local population. In this respect, the three years project implementation was aimed to put the foundation of the long term development program which should be implemented continuously until the resilience of the local population is strongly build to face the impact of the environmental degradation and the climate change. During the project implementation, many quantitative and qualitative objectives had been achieved through the hard work and persistency of the project team which started showing already the positive impacts both on the ecosystem and on the beneficiary's lives. The young mangrove trees have started to sequesterate carbon for climate change mitigation. Their ecological functions have also been observed by the beneficiaries particularly those planted in the active ponds which gave impact to the aquaculture production. As for the economic diversification activities, the accompanied self help groups had started to manage the microcredit in which they have more financial access to develop their alternative income generation in order to reduce their dependent to the aquaculture activities. Nevertheless, this is just the beginning of the development cycle. A longer term accompaniment is needed in order to enable the population to manage their development sustainably. In the objective to contribute to the resilience boosting of the local population to the impact of the environment degradation and climate change in the delta, Planete Urgence commits to continue to intervene in the area after the MADIMAP program. A new program strategy is developed based on the project MADIMAP lesson learnt, strengthened partnership with local actors, and the stronger project management team. In this sense, the supports from the external actors are deemed important in order to scale up and to sustain the impact of the program.

ANNEXE I: SUMMARY OF ACTIVITIES 2014 - 2016

Label	Objective	Year 1	Year 2	Year 3	Total achievement	%
Activity 1.1.1: The awareness of local populations, authorities and other key stakeholders on environmental protection and natural resources management is raised						
# of community awareness-raising sessions organized on environmental protection and natural resources management	21	9	6	6	21	100,00
# of raising awareness at school	7			7	7	100,00
# local authorities consultation meetings	5	5	3	1	9	180,00
# of inter-actors coordination meetings	6	4	2	2	8	133,33
Activity 1.1.2: One good practice guidebook on mangrove reforestation is published and distributed to local authorities and populations at the project's sites						
# of reforestation guidebooks distributed - 300 copies	300	100	100	100	300	100,00
# of distributed IEC material on mangrove and sustainable aquaculture	1			1	1	100,00
Activity 1.2.1: Three strategic reforestation plans are drafted					0	
# of strategic reforestation plans drafted	3	3			3	100,00
# of revision on the reforestation plans	2		1	1	2	100,00
# PCVA	4			4	4	100,00
Activity 1.2.2: The most vulnerable areas to the effects of climate change are reforested (150,500 trees planted)						
# of site verification visits	4		2	2	4	100,00
# of nurseries built	3	4			4	133,33
# of nurseries repaired	5		2	3	5	100,00
# of training sessions to seeds collection/nursery work/planting activities organised	27	9	9	9	27	100,00
# of trees planted (through the conventional method) in priority sites of interest (riverbanks, etc.)	150.500	50.000	50.500	50.000	150.500	100,00
Activity 1.3.1: A carbon monitoring procedure of the plantations is elaborated and implemented					0	
# of carbon monitoring procedures developed	1	0	0	1	1	100,00
# of carbon estimation implementation	1			1	1	100,00

Activity 2.1.1: Research action activities are undertaken to elaborate well-adapted aquasilviculture models based on reforestation and the use of organic inputs					0	
# of models of sustainable aquaculture in active ponds developed	5	5			5	100,00
# of evaluation for the model ponds	2		2		2	100,00
Activity 2.1.2: Three clusters are set up to serve as demonstration plots for the sustainable aquasilviculture model(s) developed (180,000 trees planted)					0	
# of community awareness-raising sessions organized on sustainable aquaculture (& clusters establishment)	27	12	8	9	29	107,41
# of trainings sessions organized on sustainable aquaculture	36	12	10	6	28	77,78
# of exchange visits organized (on sustainable aquaculture and by-products)	1	0	1	0	1	100,00
# of hatcheries set up	3	1			1	33,33
# of operational support disbursement	2		1	1	2	100,00
# of training sessions on micro-credit management	24	14	11	6	31	129,17
# of demonstration active ponds set up	36	11	11	14	36	100,00
# of hectares of demonstration active ponds set up	150	50	48	57	155	103,33
# monitoring kits distributed to the pond farmers	3	3		0	3	100,00
# of ponds monitoring evaluation	6			6	6	100,00
# of water quality regular check	66	0	0	66	66	100,00
# of micro-credit funds set up (in support of the aquaculture activity)	3	3			3	100,00
# of trees planted (through the conventional method) in active ponds (70%) - 126,000 trees	126.000	84.000	42.000		126.000	100,00
# of trees planted (through direct seedling method) in active ponds (30%) - 54,000 trees	54.000	36.000	18.000		54.000	100,00
Activity 2.1.3: A capitalization process on the results of the project is undertaken					0	
# of sustainable aquaculture guidebooks drafting	1		1	0	1	100,00
# of sustainable aquaculture guidebooks distributed	300	0	200	0	200	66,67
# of community feedback meetings organized (for capitalization sharing)	21	0	6	6	12	57,14

Activity 2.2.1: Crab production in inactive ponds is supported (30,000 trees planted)					0	
# of training sessions to crab production organized	31	9	6	6	21	67,74
# of demonstration inactive ponds set up	21	7	6	6	19	90,48
# of hectares of demonstration inactive ponds set up	21	7	6	6	19	90,48
# of trees planted (through the conventional method) in inactive ponds (52,5%) - 15,750 trees	15.675	4.725	6.225	4.725	15.675	100,00
# of trees planted (through direct seedling method) in active ponds (47,5%) - 14,250 trees	14.325	4.275	5.775	4.275	14.325	100,00
Activity 2.2.2: Processing activities of mangrove and aquaculture products are encouraged and a marketing support is provided to boost the sale of delta-sourced products					0	
# of micro-credit structure set up (aimed at supporting micro-project holders in launching a business alternative to aquaculture.	6	3	0	3	6	100,00
# of aquaculture products processing guidebooks distributed	300	300	0	100	400	133,33
# of Congé Solidaire® volunteering missions (on marketing)	9	0	5	0	5	55,56
Activity 2.2.3: 6 micro-credit funds are set up and villagers are trained in small business management training					0	
# of micro-credit guidebooks distributed	50	0	0		50	100,00
# of Congé Solidaire® volunteering missions (on micro-credit management)	9	0	1	4	5	55,56
						98,10

ANNEXE II: SUMMARY OF PLANTATION IN 2014 – 2016

Site	2014		2015		2016		Total
	<i>Conventional</i>	<i>Direct seedling</i>	<i>Conventional</i>	<i>Direct seedling</i>	<i>Conventional</i>	<i>Direct seedling</i>	
Tadutan							
– Area at risk	15,000	5,000	20,000		10,000		50,000
– Active ponds	28,000	12,000	14,000	6,000			60,000
– Inactive ponds	1,575	1,500	2,000	2,000	788	712	8,575
	<i>44,575</i>	<i>18,500</i>	<i>36,000</i>	<i>8,000</i>	<i>10,788</i>	<i>712</i>	118,575
Saliki							
– Area at risk	8,000	2,000	10,500		20,000		40,500
– Active ponds	27,500	12,500	14,000	6,000			60,000
– Inactive ponds	2,075	1,000	2,225	1,775	1,050	950	9,075
	<i>37,575</i>	<i>15,500</i>	<i>26,725</i>	<i>7,775</i>	<i>21,050</i>	<i>950</i>	109,575
Muara Pantuan							
– Area at risk	10,000	10,000	20,000		20,000		60,000
– Active ponds	28,000	12,000	14,000	6,000			60,000
– Inactive ponds	1,500	1,850	2,000	2,000	2,888	2,612	12,850
	<i>39,500</i>	<i>23,850</i>	<i>36,000</i>	<i>8,000</i>	<i>22,888</i>	<i>2,612</i>	132,850
Total	121,650	57,850	98,725	23,775	54,726	4,274	361,000

