Case Study Bio-rights in Guatemala

Bio-rights: an incentive mechanism linking community- and ecosystem-based approaches to disaster risk reduction

Project in brief

Objetive	1. Strengthen community resilience through an integral risk reduction approach that adresses socio-economic vulnerability and assures sound management of ecosystems and associated resources. 2. Reduce uncontrolled natural resources exploitation that could provoke disaster situations and strengthen local networks that enable communities to influence the municipal authorities.
Where	The Masá River Basin in Sololá Department, Guatemala. The priority communities are: Pakim, Municipality of Nahualá (483 persons) Tzamabaj, Municipality of Santa Catarina Ixtahuacán (450 persons) Pasaqajuyub, Municipality of Santa Catarina Ixtahuacan (534 persons) Chicorral, Municipality of Santa Catarina Ixtahuacán (46 persons)
Implemented by	CARE Guatemala and Wetlands International with support of community leaders and local authorities of the Municipalities of Santa Catarina Ixtahuacán and Nahualá.
Funded by	Humanitarian Innovation Fund (HIF) with co-funding of CARE Nederland and Wetlands International
Implementation period	February 2012 – October 2013 (21 months)
Budget	**HIF:** £ 150,000.- **Own in kind contribution:** £ 31,807.- **Total:** £ 181,807.-
Specific outputs	• 284 households (1513 people) have improved the protective capacity of their environment. • Strengthening of local coordinators for disaster risk in 4 communities. • Construction of strategic aliences with governmental entities and NGOs. • Lobby in Municipal authorities and other institutions.

Introduction

Bio-rights is a novel concept and experiences so far have been documented in the book 'Bio-rights in theory and practice'. However, the integration of Bio-rights in a disaster risk reduction context is a major innovation, as this approach facilitates efforts to reconcile humanitarian Disaster Risk Reduction (DRR) measures with nature-based solutions, creating resilience at community and landscape levels.
The basic idea of the Bio-rights methodology is providing conditional loans to invest in priorities set by communities, while the payment will be through succesfull restoration of ecosystems. In a context where disaster risks continuously exist, will occur ever more frequent, and its causes are linked to the natural environment, it makes sense to invest in DRR under the condition that people invest in the resilience of their natural envirionment.

Implenting the Bio-rights methodology, an investing organization, donor or private party provides a fund or loan to an interested community. In the process of reaching an agreement on this, the conditions for receiving the loan are established with the aim to reduce underlying causes of disaster

risks. Once agreed, the community invests the funds, for example in larger scale measures to reduce disaster risk or to prepare for inevitable emergencies, which otherwise would not have been affordable for the community.
In order to 'pay back' the invested funds, families in the community have commited to implement measures to restore and manage ecosystems because of their crucial role in reducing disaster risk, as well as to increase the capacity to deal with disaster risk. Through these activities, vulnerability of lives, livelihoods and means of income would be reduced. If the families accomplish, the loan is converted in a donation. In case they don't, they have the obligation to return the amount of the fund.
As an optional step, the loan can also be invested in resilient livelihood activities, which generate funds to strengthen the position of families to either pay back the loan in case of non-compliance, or to save, re-invest and have an emergency fund available.
The following schematization visualizes the model, which in this paper will be explained along to the Guatemala case study.

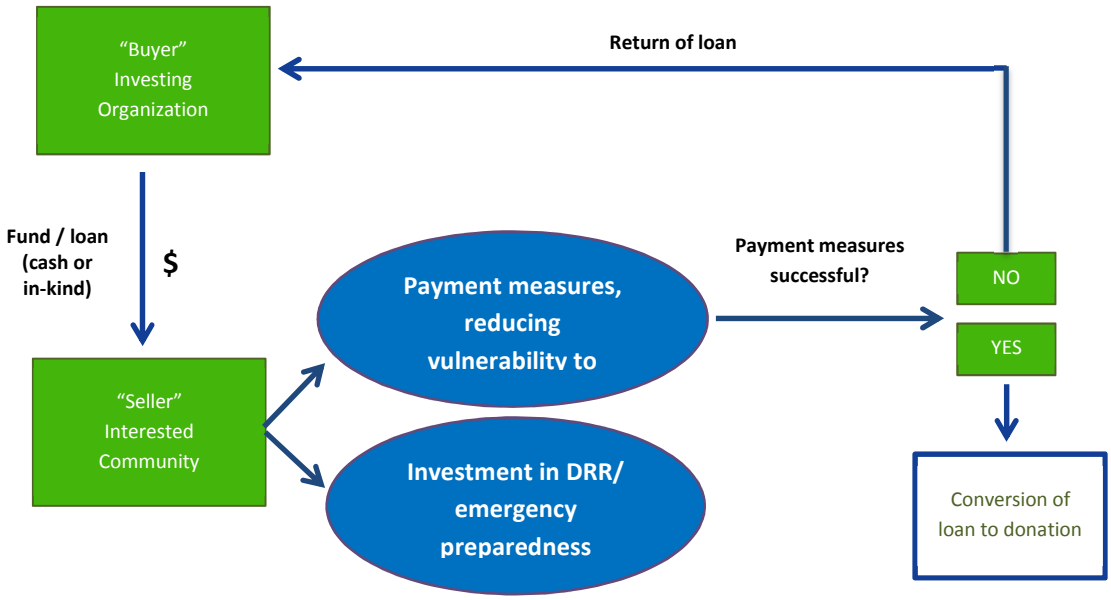

Figure 1 Visualization of the basic Bio-rights model tested for DRR.

Project initiation

Guatemala is a country prone to multiple hazards, such as hurricanes, earthquakes, floods, droughts, and volcanic eruptions, and is part of the so called Pacific Rim´s "ring of fire". The northern part of Guatemala has a tropical climate with maximum rainfall from May to September. The west and south of the country is very mountainous with moderate rainfall and a distinct dry season from November to April. Rainfall is heavier along the Pacific coast that is vulnerable to seasonal flooding. Guatemala is located in an area of high volcanic and seismic activity. The combination of these various hazards causes frequent disasters, amongst others landslides. Over the last 20 years the most frequent disasters have been floods (23) and storms (13) (e.g. Hurricane Mitch in 1998 and Tropical storm Stan in 2005).

In this hazard-prone country, the Bio-rights methodology was piloted as an approach in Disaster Risk Reduction in the Western pacific area, at the rim of the mountainous west, in the river basin of the Nahualate river.

The river basin of the Nahualate river is situated in the Guatemalan municipality of Nahualá, Department Sololá. In the local language Nahualate means 'enchanted water'. This watershed drains 94% of the total municipal area, and people strongly depend on it for their livelihoods. The forests associated with the watershed provide firewood and construction materials. Social practices however negatively affect the ecosystems in the region, and have adverse impacts on livelihoods resilience. The absence of controls in the small community forest reserves has led to illegal logging and encroachment of agricultural lands into forest areas. This has resulted in erosion that leads to increased landslides, causing significant damage to middle and lower parts of the region.

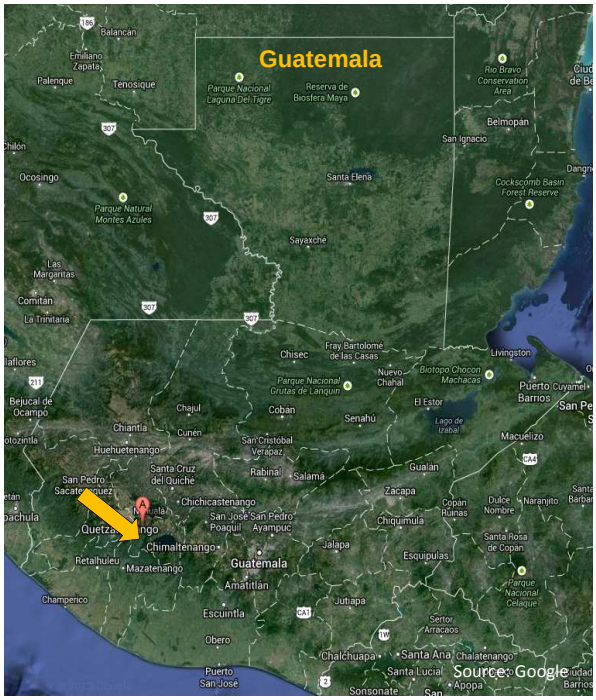

Figure 2 Map of Guatemala

According to official data, 75% of the population in Sololá Department is affected by poverty. Short-term needs win over long-term sustainable investments, hence local communities are trapped in a negative spiral: poverty leads to environmental degradation; loss of ecosystem functions cause increased vulnerability, which exacerbates poverty.
Poverty in this region has also prevented the population to develop and implement disaster risk reduction or mitigation plans. For example, during Tropical Storm 'Stan' in 2005 and 'Agatha' in 2010 critical shortages of food affected many families and prolonged their recovery time, exacerbating existing poverty.


Figure 3 Landslide area, also affecting crops


Figure 4 Woman and boy walking the slopes in Sololá

CARE and Wetlands International have initiated this pilot project based on their experience in humanitarian and development issues, and ecosystem management, and their history of collaboration in several occasions. In Guatemala they are collaborating in the Partners for Resilience (PfR) alliance, aiming at strengthening resilience through integrating disaster risk reduction (DRR), climate change adaptation (CCA) and ecosystems management and restauration (EMR). In a community where risks are linked to the degradation of the environment and ecosystem, cooperation between environmental and humanitarian actors is essential.

Box 1 Partners for Resilience (PfR)

The Partners for Resilience (PfR) are an alliance of the Netherlands Red Cross, CARE Netherlands, Cordaid, the Red Cross/Red Crescent Climate Centre, and Wetlands International. The PfR aim to reduce the impact of natural hazards on the livelihoods of over 400,000 vulnerable people worldwide. The name originates in the fundamental belief of its five members in the central role of resilience as the way to deal effectively with disasters. This means the PfR use an integrated approach to mitigate disaster risk and enhance livelihoods, particularly by addressing climate change and ecosystem management and restoration. The PfR work together with local implementing partners in nine countries: Ethiopia, Guatemala, India, Indonesia, Kenya, Mali, Nicaragua, the Philippines and Uganda. The Partners for Resilience programme is financially supported by the Dutch Ministry of Foreign Affairs.

The restoration of ecosystems and their functions (erosion control, soil stabilization, water regulation, storm protection) is an important yet underrated element of disaster risk reduction, that should ideally go hand in hand with other measures like household or community level risk mitigation. In a development context and with development and conservation aims the approach has been piloted and widely implemented already in Indonesia and Mali. In Guatemala, however, the organizations explored how Bio-rights can be integrated into the disaster risk reduction planning cycle.

Project development

For the development of the pilot project, first the project team needed to be composed, which consisted of a project coordinator, a development facilitator specialized in DRR and a development technician specialized in ecosystems. The selection of the team members was based on: training; experience in similar projects; knowledge of the local language, and; gender equality.

The working area was selected based on the analysis and experience of the Partners for Resilience programme in the region. The main characteristics for the selection are the risk levels, the occurrence of hazards, the level of vulnerability of the communities, the low capacity to deal with risks, but also the experience of the partners in the region, and the posibility to apply a watershed approach. Then, the selection of the specific communities was done through field visits, meetings with the PfR and Bio-rights project teams, in coordination with community leaders. Factors considered were the local administrative political context, natural resources situation, the interest of the community to engage in the project, the possible link with the Partners for Resilience project considering its longer time frame, and availability of resources. From this process the joint decision was taken that the Bio-rights project would concentrate on four communities neighbouring the PfR work area.

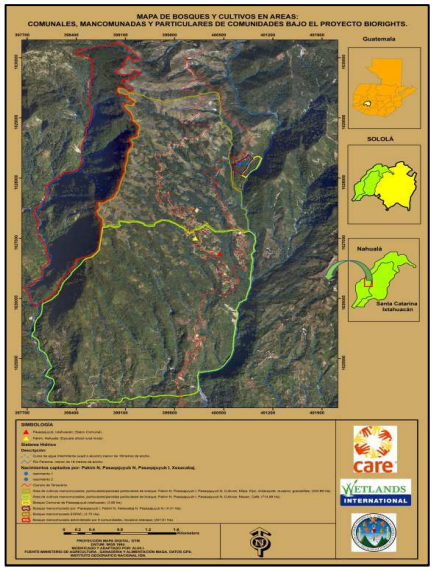

Figure 5 Project area map

The 4 communities are geographically located in the middle of the Masá river sub-basin. Although it was initially planned to implement the project only in communities of Nahualá municipality, during the preparation of the risk analysis it was identified that the people and families who are living in the same territorial area are registered as residents of both Nahualá municipality and Santa Catarina Ixtahuacán municipality. Therefore, a watershed approach working model was applied, and not one according the political administrative divisions.

The concept development was initiated during the kick-off workshop of the Bio-rights project in which the Bio-rights model was adapted to the local context of the working area.

Table 1 Selected pilot project communities

Community	Elevation (meters)	Total Population	Total # of Families	Principal agricultural land use
Tzamabaj Ixtahuacán	1,691	450	70	Subsistence agriculture and to a lesser extent commercial Maxán leaf and coffee growing
Pakim Nahuala	2,385	483	89	Subsistence agriculture and to a lesser extent commercial Maxán leaf and coffee growing
Pasaqajuyub Ixtahuacán	2,136	673	139	Subsistence agriculture and to a lesser extent commercial Maxán leaf and coffee growing
Chicorral	2,145	46	20	Subsistence agriculture (these small families live in very difficult conditions)
TOTAL		**1513**	**284**	

Based on the experiences within the PfR alliance, it was considered essential for this pilot to collaborate with the National System for Disaster Risk Reduction (CONRED), the National Council of Protected Areas (CONAP), Municipalities, the existing community structure and civil society.

To establish the levels of collaboration that allowed the smooth implementation of the project, the sustainability of processes and the strengthening of local capacity for advocacy and management, the *Outcome Mapping* method was applied in which the partners at different level were identified and the benchmark markers were established (see box).

The consultation of the direct actors consisted of the presentation of the project to the authorities. First the Municipal Corporations, Community Municipalities, education authorities, health sector and other public and private entities were approached.

Then, the community leaders were identified through field visits and/or home visits. After locating and sharing the project with the decision-making group in each of the communities, community meetings for the consultation and the identification of interest for the implementation of project activities, including development of Local Coordinating boards for Disaster Reduction (COLREDs), were scheduled.

Box 2 Outcome Mapping

Outcome Mapping is a project progress measurement system that focuses on behavioural change exhibited by secondary beneficiaries. Therefore, different so called boundary partners are identified.
Direct boundary partner: individuals, groups or organizations that have the interest or power to influence (positively or negatively) in progress towards the Vision, the iniative works directly with them.
Indirect boundary partners: individuals, groups or organizations that have the interest or power to influence (positively or negatively) on progress towards the Vision, the initiative does not work directly with them but through the direct boundary partner.
Strategic partners: individuals, groups or organizations that have the potential to contribute to the mission of the initiative. The initiative works with these, but do not try to influence their behavior, actions or relationships.

At the beginning of the project, the first contacts were with the Community Development Committees (COCODEs) because they are the legitimate community organizations to liase with. In the course of organizing the COLREDs, the same community assembly decided that the participation is voluntary and therefore, members of the Council community also form part of the Local Coordinator for Disaster Risk Reduction. One advantage observed is that there is a good level of coordination with the various organized groups.

In addition, the *indirect boundary partners* that belong to the Municipalities Nahualá and Santa Catarina Ixtahuacan of the Department of Solola and that are comprised of COCODEs, Rangers, COLREDs, midwives, teachers, students, family groups were identified.
Finally, the *strategic partners* were identified, which are: School Principals, Municipalities, Community Mayors, Association Friends of the Ixtacapa River, and the health Sector, among others.

In cooperation with the identified partners progress markers were selected, indicating the expected, hoped, and ideal change during the implementation of the project:

Table 2 Outcome Mapping progress markers of the COCODE and COLRED

Boundary partner: COCODE > COLRED			
Expect to see 1) Knowing the Bio-rights model. 2) People are interested. 3) People are organized.	***Like to see...*** 4) Elaboration of plan. 5) Every committee accomplishes their tasks. 6) COCODE take leadership of the model in the community. 7) COCODE influence in other spaces in favour of the model.	***Love to see…*** 8) Model is replicable in other communities. 9) Model is sustainable in time.	**Desired Outcome**: Reduce levels of economic, social and environmental vulnerability to disasters.

In order to ensure that the identified community needs are the key priorities for the investments and to have a profound understanding of the community capacity for the implementation of the investments and for paying it back through the conditional activities, studies were carried out.

Disaster Risk Analysis: A general disaster risk analysis was performed for the region of the Masá river sub basin and specific analyses in the 4 prioritized communities using the Climate Vulnerabilities and Capacities Analysis (CVCA). The analysis was performed at the community perception level, supplemented with a technical scientific component that analyses risk through the analysis of maps and biophysical variables. In addition, within this component an analysis of landslide susceptibility has been done using the Mora-Bharson methodology that involves the analysis of various physical factors: geology, geomorphology, land use, slope orientation and percentage, and trigger factors, which in this case is the rain. The PfR programme partner Association Vivamos Mejor provided technical support to incorporate the technical-scientific component.
This information has enabled a comparative analysis of current perceptions against historical data that allows to line out risk trends in the area in the best way.

Estimated payment capacity of communities: CARE developed a concept and tool to calculate and allocate the payment of the activities funded by the Bio-rights project and agreed in the community assemblies. It is based on technical criteria for the components: ecosystems, livelihoods, capacity building and DRR. The analysis was done with the inputs collected through transect walks, focus group discussions, mapping of individual and joint community resources in the programme Arcgis, among others. This generated the identification of local resources.
For the calculations the following methods were used:

- In the *capacity building* component the committed actions were valued according to the days that could be contributed by each family in the community, counted according to the rate of minimum wage in Guatemala for agricultural activities.
- In the *mitigation measures application components* related to DRR and soil conservation the number of cubic meters of soil removed and the time provided per family for the removal and cleanup according to the minimum wage rate for agricultural activities were included.
- For the monetization of *forest management and conservation* of community, private and mancomunal areas, the rate used by the of the National Forest Institute (INAB) in their protection component of the Forestry Incentive Programme for Small Land Owners (PINPEP for its Spanish acronym) of the of the Government of Guatemala was applied and the contributed time by each family according to the minimum wage rate.
- For the *livelihood* component the minimum daily wage rate prevailing in Guatemala was applied.

On the other hand, the unskilled labor that each community provided in construction of the investments, financed by the fund granted by the Bio-rights project, was not considered as part of the payment of this fund.

Community Natural Resource Management Mapping: Through this activity land tenure maps of each community were generated and analysed, mapping water resources, soil, comunal, mancomunal, private and municipal forests. As part of his supervised professional internship, a forestry student of

the San Carlos University supported this activity. The analysis of each generated map allowed a focused and high impact intervention in each community, and was determining in estimating the payment ability of the communities.

Connecting the Bio-rights plan to large scale initiatives: Because ecosystems are is not limited to a local situation, but by definition are related to a greater area, the Bio-rights plan is linked with two macro plans in the project area.

- *Corredor Biocultural y de Desarrollo Sostenible Zunil-Atitlán-Balam Juyú*[1]: The proposal for the Bio-Cultural and Sustainable Development Corridor Zunil-Atitlan-Balam Juyú comes from the recognition of the existence and permanence of a strip of predominantly broadleaf forests along the western and central volcanic chain, from the volcano on the border Tacaná with Mexico to the Tecuamburro volcano in the department of Santa Rosa. The plan identifies different fundamental reasons to promote and manage the proposed area as a corredor. The Bio-rights project contributes to these reasons, specifically disaster prevention and risk reduction to climate variability, through the maintenance and recovery of forest cover of the natural ecosystems, agro-ecosystems and the landscape in general.
- *Management Plan of micro river basin Masá in the river basin Nahualate*[2]: The watershed management plan is part of territorial zoning that is defined by: 1) Forest management area, 2) Ecosystem recovery area; 3) Zones of production management and food security, 4) Road protection areas, 5) Water protection zones; 6) Slope protection area, and 7) Areas of rural community care. One of the specific objectives of the management plan is to reduce the social and environmental vulnerability to climate risk (variation and climate change) through the implementation of adaptation and mitigation measures. Through the works of conservation and mitigation the Bio-rights project contributed to achieving the objective.

Contract development

At the start of the project (2012) the negotiation with the people started in order to prepare the conditions in communities so the leaders could take ownership of the processes and explore the model of the project. This ensured that families understood clearly that the funds are loans implying that the prioritized community projects will be paid back by the community through the following works: soil conservation through modification of slopes, implementation of natural barriers through hedgerows, forest management, reforestation in areas with high erosion and deforestation, and adapt livelihoods to diversify revenue.

In the negotiation process the following steps were taken:

- Visits and meetings with members of COCODEs, Community Mayors, Rangers and members of the COLREDs to consult on natural resources management like water, forest and land tenure in the region, and in the local Maya culture.
- Conducting community meetings for the identification, selection and approval of projects funded by the Bio-rights project and actions for the conservation and recovery of ecosystems. Therefore, working groups were formed: a) soil conservation, b) management of forest plantations, c) improvement of passion fruit production, d) agroforestry systems, etc., depending on the needs of the families.
- Determine the payment capacity of communities, validation of the contents of the agreement with members of the COLREDs and distribution of responsibilities for monitoring activities.
- Submitting and negotiating other resources with municipalities and private entities, like Association Friends of the Ixtacapa River, Municipality of Santo Tomás la Unión, and the Ministry of Agriculture, Livestock and Food (MAGA).
- Analysis of information generated in the Natural Resource Mapping and Risk Mapping.
- Field visits in coordination with community leaders.
- Elaboration of contract and final content review by the community, Wetlands International and

[1] Secaira, Estuardo. 2011. Corredor Biocultural y de Desarrollo Sostenible Zunil-Atitlán-Balam Juyú. Guatemala. Vivamos Mejor. 59 pages.
[2] 2012. Plan de Manejo de la Microcuenca del Río Masá. Guatemala. Vivamos Mejor. 184 pages.

CARE.

- Planning and preparing the logistics for the signing of agreement between the parties.

Agreements were signed between communities, local authorities, CARE and Wetlands International on the commitments of each community with regard to the projects financed by the Bio-rights project. To consider the cultural aspects of the communities and the municipality, the following persons participated in the signing ceremony: municipal mayors and members of municipal corporations, school principals, rangers, community mayors of communities in Nahualá and Santa Catarina Ixtahuacán, women, elders and regional media.
The signing of the agreement took place in two micro-regions in order to facilitate the exchange of experiences and information between participants from authorities and communities. The first meeting took place in Pasaqajuyub Ixtahuacán and the second in Tzamabaj. About 140 men, women and children participated.
The agreements will be valid until August 2014, and are transferred and followed up under the PfR programme.

Project implementation

Loans disbursal

With the signing of the agreement the value of the planned investments and the payment conditions were established. CARE financed the investments directly, including the contracting of the external services that were needed, because the COLRED organizations and women's groups are no legal entities as a group, which in this case hindered the receipt of the loans directly.
The loans were paid back through agreed activities in DRR and ecosystem management, participation in capacity building, amongst others. These were the conditions to be able to access the loan.

For a sustainable implementation the involvement of the Municipal Corporations was achieved, who provided funding for the construction of the community hall in Pakim Nahualá and the construction of a community classroom of Chicorral Ixtahuacán.
In addition, the Municipal Office of Planning and Forestry provided plants for the reforestation programme in each of the communities, in coordination with the Association Friends of the Ixtacapa River. This contributed to collaboration between public and private entities, and contributed to local principles and cultural values, especially in the field of conservation, ecosystem recovery and disaster risk reduction. To formalize the partnership between the parties, agreements and letters of understanding were signed improving relations between local government and communities.

The investments financed with the loan have the objective to reduce vulnerability in disaster events and strengthen the conservation of ecosystems with a crucial role in reducing disaster risk:

- Pak'im community, Nahualá: Construction of a multipurpose community room, which normally will be used for meetings and other social and cultural activities of the community and in emergency and/or disaster events it will be used as a shelter for homeless people or relief items collection center, as needed. Total funding for this construction was Q.188,097.25 (€18.320,34), with a contribution of the Municipality of Nahualá of Q.15,000 (€1.461,00). The loan was Q.173,093.81 (€16.859,34), and paid by 89 families. The contribution of the municipality reduced the obligations of the community to the project and facilitated a better link between the community and its municipals authorities.
- Chicorral community, Santa Catarina Ixtahuacán: Construction of a school classroom, which normally will be used for educational activities of children in the community, meetings and other social and cultural activities of the community and in emergency and/or disaster it will be used as a shelter for affected people or relief items collection center, as needed. Total funding for this construction was Q.114,349.25 (€11.137,68), with a contribution of the Municipality of Santa Catarina Ixtahuacán of Q.26,200 (€ 2.551,88). The loan was Q.88,149.25 (€8.585,80) and paid by 20 families.
- Pasaquijuyub community, Santa Catarina Ixtahuacán: Rehabilitation of 5 kilometers of dirt road, which in normal situations serves as the main access between the community and its major

market and trading centers. In emergencies and/or disasters during seasons of heavy rainfall, like during the Tropical Depressi on E12 in October 2011, this stretch of road has left the population of this and other communities isolated, limiting communication and emergency aid. The loan for this work was Q.93,120.00 (€9.069,89) and paid by 105 families.

- Tzamabaj community, Santa Catarina Ixtahuacán: Extension of the school area, which normally will be used for educational activities of children in the community, meetings and other social and cultural activities of the community and in emergency and/or disaster it will be used as a shelter for affected people or relief items collection center, as needed. The loan for this construction was Q.143,437.62 (€13.970,82) and paid by 70 families.

Figure 7 Constructed community hall and shelter

Figure 6 Access road improvement

Payment throught capacity building and awareness raising

Training and awareness raising activities contributed to the community understanding and ownership of the plan.

For capacity building, a training plan focused on teaching and training community leaders, relevant actors and members of the COLREDs in the communities was developed. The plan included the following objectives:

- Train the members of the COLRED in Chicorral, Tzamabaj Ixtahuacán, Pak'im and Pasaquijuyup, to act as a responsible party in emergency events, and get to gain the accreditation by the National Coordinator for Disaster Reduction (CONRED).
- Educate community leaders and other stakeholders (health and education sector) on the importance of conservation of ecosystems and the effect of climate change and implications for vulnerability to disasters.

Regarding training for the accreditation of the COLREDs, which was the first module that was conducted, the people have received trainings on the following topics: conceptual framework and legal basis of DRR management, signposting, community, Damage Assessment and Needs Analysis (EDAN), Shelter Management, Global Warming, construction of risk scenarios and community maps, commissions and functions of the COLREDs and other actors, Organization, Hygiene Promotion, Search and Rescue.

In the second module, focusing on ecosystem management, training was provided on the following topics: Basics of Climate and Climate Change, the causes of Climate Change, Policies and Measures on Climate Change: Working to solve the Climate Change problem, Managing and valuing forests to benefit the climate, community and biodiversity, and new ways to assess the role of forests in reducing disaster risk and climate change mitigation.

The contents of the second module was developed by the technical staff of Wetlands International, with support from the staff of the Institute on Climate Change (ICC - an organization established and supported by the sugarcane industry in Guatemala), of Association Vivamos Mejor and of the National Forest Institute (INAB).

80% of training activities were conducted in each community or in nearby communities, with the aim to ensure more participants and especially female COLRED members and/or female community leaders. The participation of women is something that for cultural and traditional issues linked with

the lack of opportunities and gender inequality, is not possible when the training is organized outside the community.
The days of participation in DRR/CCA/ERM trainings are accounted for as payment of the loan. Also, DRR trainings served to fulfill requirements for accreditation of members of the COLRED from the Executive Secretariat of CONRED.

Also, various awareness raising activities were carried out such as the celebration of International Day for Disaster Risk Reduction (2012 and 2013), celebration of World Wetlands Day (2013), and printing and distribution of calendars with key messages related to the issues addressed by the project.

Figure 9 Awareness raising signs


Figure 8 Exploring the terrain with COLRED

Payment through ecosystem management and DRR activities

Communities agreed to implement certain 'payment measures' and received technical support in the implementation of disaster risk reduction and conservation measures. These include:

- 10,5 hectares of land was adjusted with ditches, absorption wells in areas where corn and Maxán is grown, and hill slope contour lines. This is more than the planned 6,6 hectares. Modification of slope geometry around homes reduces the risk to landslides, subsidence and the formation of mud flow.
- In Pakim and Pasaqajuyub 28 tree growing bases with wooden nursery frameworks were constructed in order to improve the production of passion fruit and plants, using methods and techniques that allows plants to receive more hours of daylight, adequate nutrient uptake, use of space, etc.
- Through request to private organizations, the communities achieved to obtain tree seedlings of the common alder and cypress, with which two community tree nurseries were established, with a capacity of about 5.0000 trees, plus a passion fruit seedbed.
- By applying simple techniques and forest management methods and tools, the pruning and cleaning of 12.51 hectares of forest in 4 communities was achieved instead of the original planned 8.71 hectares.
- Change in slopes geometry and natural barriers (hedgerows) were achieved, a total of 1,800 live barriers and 430 mts in of terracing in the 4 communities. The objective of planting natural barriers hedgerows around homes is to contribute to the stabilization of slopes, reduce soil erosion and related risk of landslides to families.
- In all communities forest fire breaks/firewalls were established in private, communal and mancomunalf forest areas.
- Local DRR and response plans have been developed and are pending to be approved by the SE-CONRED for accreditation of the 4 COLREDs. They will be updated in coordination with the participating communities of the PfR programme during 2014.
- Integrated Community Disaster Risk Reduction Plans are developed to use as as planning tools, linked to other plans like the Masá river micro-watershed management plan, response and/or disaster contingency plans and municipal development plans. These have been set up and

updated in a participatory manner and will be renovated as progress is made in the coordinated activities with PfR.

It was evident that the interaction between municipality and community contributed to a firm adoption of the agreements and an understanding of what needs to be accomplished.

Figure 11 Tapescos (wooden nursery frameworks)

Figure 10 Slope stabilization

Box 3 Revolving Bio-rights fund

In the light of disaster preparedness a revolving fund was set up in 3 communities in which women groups were trained on how to manage this fund. The purpose of the revolving fund is to reduce the community vulnerability through pilot projects on income diversification and livelihood, which contain a savings component that can be used in case of emergencies at community level. For the funds financing agreements are established, in which the conditional payment measures that will apply for these small grants is described using the same principle as for the large community funds: access to the funds requires payment in the way of ecosystem management activities, with the difference that small incomes can be generated with the investments, strengthening the ability to re-pay or re-invest the loan. Further implementation and monitoring of these funds will be done by the PfR programme.

Project Monitoring and Evaluation

The monitoring of the project has been done at different levels: the implementation of the funded investments, the payment measures, and the behavioural change.

With regards to the implementation of the *funded investments*, CARE staff with experience and training in this area, conducted monitoring visits and supervision to ensure quality in materials and compliance with the structural designs of infrastructure works.

To monitor the degree of *progress in the implementation of the payment measures*, regular field visits were conducted by the technical staff of CARE and Wetlands International. Additionally, there were monitoring visits by staff external of the project. For example, the technical staff hired by Wetlands International and responsible for the micro projects of the PfR programme conducted a field visit to monitor community forestry nursery management of private plantations, reforestation in particular areas, building in the wooden nursery frameworks in Pakim and reforestation in a communal area of Pasaqajuyup. In addition, two technical staff from the National Forest Institute (INAB) conducted monitoring of the reforestation, in particular in Chicorral.
With regard to the evaluation of *training* on Disaster Risk Reduction, Climate Change Adaptation and Ecosystem Management and restoration, surveys were conducted to evaluate the instructor, content, format and learning to recognize the level of acceptance of the participants, obtaining a rating of an average of 84% on trainings that were carried out.

For monitoring and evaluation of *attitude change*, the "outcome mapping" methodology was used. During the training event on the methodology, the vision and mission were developed, direct and strategic partners were selected, and the progress markers for the M&E of the Bio-rights project were determined. From there, under this methodology, within the regular activities and community visits being made by the project staff, the established progress markers were monitored. During the first assessment visit, after reviewing until what step of the progress markers communities have arrived, one of the community members said that they can no longer fall back to the old situation (go down the ladder, as visualized in the Outcome Mapping methodology), the only thing they can do is move forward. At the end of the project, during the last assessment of the progress markers the communities identified new needs and expressed that they want to continue working under the same Bio-rights model.

The conversion of loans to donations is done when the conditions of the loans are successfully implemented. For the case study in Guatemala, it proved to be essential to link the short trial phase to a longer term programme of the Partners for Resilience Alliance, for planning, sustainability, and seasonal patterns and limitations. The obligations are transferred and the PfR staff will continue monitoring, in order for the final payment measures to be concluded during the dry season early 2014 and during the first phase of the rainy season (June-August 2014). The PfR team of CARE will monitor compliance of the agreements and the incorporation of the 4 communities PfR other activities.
Compliance so far is provided in detail in the Annex to this case study.

Project outcomes

Next to implementation of the funded investments (construction works) and payment measures agreed in the agreement, the following has been achieved.

Reducing vulnerabilities and improving the protective capacity of the environment:

In the 4 involved communities 285 households have been engaged in the project, and actually, through the payment activities the protective capacity of the environment around their homes is improved, as well as of slopes and forests that benefit the community. Additionally, through the investments in emergency preparedness infrastructure, also in the case of the unavoidable disaster, the communities have improved their capacity to deal with this.
Also, livelihood vulnerability is reduced due to the strengthening and diversivication through some of the payment activities, like nursery beds for passion fruit production. Also the acess to the small revolving funds for women groups supports their means of income, generating an emergency fund, while through the conditions to access these funds, ecosystem management activities are committed and implemented.

Strengthening Community organization

Community organization was strengthened through the formation and training of COLREDs and involvement in project activities of members of the Community Development Councils (COCODEs) and other community leaders. The strengthening was evident not only at the level of understanding of the Bio-rights model, but also through the measures that have helped to reduce levels of disaster risk at each location. The organizational structure is strengthened through the implementation of comprehensive DRR plans. Improvements in humanitarian actions have been proven, e.g. for small emergencies generated by heavy rains in 2013 and strong earthquakes in November 2012 and September 2013 that hit western Guatemala, the COLRED had strengthened its ability to handle information on the situation of communities, and to transfer information to the municipal level and CARE staff that was stand by in the situation.
Furthermore, the organization and the involvement of members of the families, especially the women was achieved through specific initiatives (seedlings, soil conversation).
The community management capacity was also increased to influence additional resources to benefit the entire community. For example, the request towards the Ministry of Agriculture, Livestock and Food (MAGA), who in Chicorral distributed 10 pounds of bean seeds, improved by the Institute of

Agricultural Science and Technology (ICTA), to each family in order to diversify their livelihoods. For this, MAGA technical field staff conducted a technical demonstration for proper planting of the distributed seed.

Building strategic alliances

The coordination with the Association Friends of the Ixtacapa River (ADRI) is established and maintained in order to receive medium and long term support, in the implementation of activities that promote the conservation of natural resources in the middle and upper part of the sub river basin Masá and the river Ixtacapa.
In addition, the alliance with the Universidad de San Carlos de Guatemala (USAC) was strengthened.
Other partnerships were implemented in specific activities through technical support of the National Council of Protected Areas (CONAP), Mariano Gálvez University, Ministry of Agriculture, Livestock and Food (MAGA), National Forest Institute (INAB), Climate Change Institute (ICC) and Association Vivamos Mejor.

Impact on local authorities and other institutions

For the implementation of the works funded by the project, the COLRED and other community leaders organized to apply for financial support to the municipalities of Santa Catarina and Nahualá Ixtahuacán, which supplemented the payment of the works in Chicorral, Santa Catarina Ixtahuacán and Pakim, Nahualá.
In addition, coordination with the Municipal Forestry Offices of the two municipalities was established for reforestation and management of private and communal forests, and has lead to the donation of trees.
The coordination with the Ministry of Agriculture, Livestock and Food (MAGA) has been initiated and it is expected to be maintain in the implementation framework of PfR programme with the objective of technical assistance to the population of the 4 communities promoting the implementation of demonstration crops plots with varieties resistant to pests and new diseases possibly caused by climate change, and help in the process of building community.
Interest by the PINPEP programme of National Forest Institute (INAB) to support these communities is generated.

Replication

The Bio-rights framework is not bound to site-specific socio-economic or environmental characteristics and can be replicated in other areas, with the appropriate analysis and links to local actors, and linked to a longer term programme of local or external actors. The project has documented the approaches and actively disseminated these among NGOs involved in the Partners for Resilience programme, participants of the UNISDR Global Platform for DRR, government institutions at various levels in Guatemala, including the Executive Secretary of CONRED, interested in replication. Other PfR partners and countries are planning for replication. For guidance in the replication interested parties can consult the case study elaborated, complementing the original book **'Bio-rights in theory and practice'** as well as an online presentation available at the websites of the partners.
The mechanism of conditional loans granted to each community was an initiative that helped strengthen internal community coordination, improved collective responsibility and allowed communities to establish an economic value to the various DRR, CCA and EMR activities performed. It also generated experience that can be useful when communities choose to access other incentive programmess such as the Incentives Programme for Small Holders (PINPEP) promoted by the National Forest Institute (INAB) throughout Guatemala.

The overall achievement of this project is the establishment of a financial incentive mechanism that strengthened the relationship between the community and its ecosystem, for disaster risk reduction.

Lessons learned

+ A conditionality mechanism, combined with DRR activities contributes to responsibility and ownership in managing the risks communities are facing.

The communities have adopted the Bio-rights model and have shown interest in continuing to work according the model. The basic element of Bio-rights, the conditionality of investment and the commitment to contribute to the community, has generated a sense of increased 'ownership'.
The investment of a loan or credit in a work and community need contributes to responsibility and the community organization. Building on the awareness of people to strengthen the sense of belonging, giving greater participation of children and youth, to educate them in the comprehensive approach.
However, It was difficult to translate the payment of individuals to community work because it is important to ensure that the whole community is benefited with the investment. Also, it is required to "sit and plan" taking into account the climatic seasons, to avoid divisiveness and isolated work in communities, always taking into consideration its own complexity.

+ Connect the short term Bio-rights Model to medium and long term programmes.

Because of the link with the PfR Programme, which has a longer time scale, give sustainability and follow up to the achieved actions, especially the means of conservation. The time available for implementation was short term, while previous experiences were medium-term (3-5 years) and the timeframe for ecosystem restoration is long term.

+ Involve and influence authorities

Influence with government entity to achieve support and link the Bio-rights model to existing plans. It was possible to have a constant support from the municipalities and influence the decisions of the authorities or decision makers within municipalities to replicate the Bio-rights model, promoting the commitment at the community level for their own development.

- With a better understanding of risks and the ecosystem context before deciding on the investment works with the loans, the link between ecosystems and underlying causes of disaster risk in all elements of the project could be better maintained.

If the objective of applying the Bio-rights methodology is to reduce disaster risk, directly linked to environmental degradation, the invested loans as well as the payment measures should be designed and decided with a focus on DRR and ecosystems.
Nevertheless, the investments made with the loans focus on the preparedness for the inevitable disaster, instead of tackling underlying causes of the identified risks. It would have been necessary to invest time in training before prioritizing the investments to improve the quality/relevance of the investment. When identifying the works to invest in, you must start with an awareness process on environmental issues or ecosystem recovery and DRR, so the works selected are linked to the integral approach and underlying causes of the risks.
Still, activities implemented as payment measures supported risk reduction, at a small scale, around the house and on lands of the population.

- A strong and fully trained local project team from the beginning, could have made the start up, and facilitation of the process easier.

Working in a multidisciplinary team has helped to convey the holistic approach to DRR and ERM. Nevertheless, more time and resources should have been invested to establish and train this team. Technical assistance in the implementation of Bio-rights model by team was insufficient due to lack of prior structured training to the technical team. More intensive training on the Bio-rights model including disclosure of past experiences, ensuring this is available in the appropriate language and adapted to the culture would have benefited the team, and tools and previous experiences of the Bio-rights model could have been used better, like the checklist for selecting communities, forest survey and agreements. To facilitate the implementation process, the team structure and teamwork should be clear and well managed.

! Ensure continuous quality monitoring of the implemented work and community processes.

Qualitative monitoring (Outcome Mapping) was more constant than quantitative monitoring. The "Outcome Mapping" methodology has helped to visualize the impact of disasters and generated attitude change in communities. Ongoing monitoring should be performed by technical staff and communities through coordinated actions between members of the technical team and in communication with the community. Also monitoring should be carried out by responsible entities, like authorities, which requires a change in legislation, mandate, or a commitment.

! Involve and apply the right level of expertise

Include external experts in the trainings according to the needs of the local beneficiaries. Needs should be monitored. The trainings have been successful, due to the inclusion of other actors like the university students.

For the communities the training in the integration between DRR and ecosystems was quite complex, so it is important to be analytical and channel community priorities and/or needs, trying to link scientific and traditional knowledge, but at the right level and messages.

! Apply a participatory approach at all levels, from communities to authorities and partners.

Include all actors from the beginning, although the consultation process may take more time, it would give more legitimacy to the decisions made. The involved actors/organizations must appropriate the model from the start.

! Land ownership

Communities should own the land. Otherwise, this requires additional dialogue with owners or neighbouring communities or authorities. Bio-rights is a business deal. If the community does not own the land it is complicated, it is an additional challenge. However, it can be solved by involving the owner of the land in the agreement. If not, it is not recommended. Establish / clarify the conditions for ownership of the areas to be preserved or restored in order to avoid future problems between authorities, local leaders and the community at large was another situation that hindered the progress of work. There were limitations on what could be done on the preservation of water sources, as they belonged to several other communities not involved.

(+ = 'positive' lesson learned; - = 'negative' lesson learned; ! = key point)

Acronym list:

ADRI	Association Friends of the Ixtacapa River
CCA	Climate Change Adaptation
COCODE	Community Development Council
COLRED	Local Coordinator for Disaster Reduction
COMRED	Municipal Coordinator for Disasters Reduction
COMUDE	Municipal Development Council
CONAP	National Council of Protected Areas
CONRED	National Coordinator for Disaster Reduction
DRR	Disaster Risk Reduction
EMR	Ecosystems Management and Restauration
ICC	Climate Change Institute
INAB	National Forest Institute
MAGA	Ministry of Agriculture, Livestock and Food
PfR	Partners for Resilience
PINPEP	Forestry Incentives Programme for Small Land Owners

ANNEX – INVESTMENTS AND PAYMENT DETAILS PER COMMUNITY

a) **Pak'im community, Nahualá**: Construction of a multipurpose room of the community, which normally will be used for meetings and other social and cultural activities of the community and in emergency and/or disaster events will be used as a shelter for homeless people or relief items collection centre, as needed. Total funding for this construction was Q.188,097.25, with a contribution of the Municipality of Nahualá of Q.15,000. The loan was Q.173,093.81, as signed in the agreement and paid by 89 families. The contribution of the municipality reduced the obligations of the community to the project and facilitated a better link between the community and its municipals authorities.

b) **Pasaqajuyub community, Santa Catarina Ixtahuacán**: Rehabilitation of 5 kilometres of dirt road, which in normal situations serves as the main access between the community and its major market and trading centres. In emergencies and/or disasters during seasons of heavy rainfall (e.g. Tropical Depression E12 in October 2011) this stretch of road has left the population of this and other communities incommunicado, limiting communication and emergency aid. The loan for this work was Q.93,120.00 and paid by 105 families.

c) **Tzamabaj community, Santa Catarina Ixtahuacán:** Extension of the school area, which normally will be used for educational activities of children in the community, meetings and other social and cultural activities of the community and in emergency and/or disaster will be used as a shelter for affected people or relief items collection center, as needed. The loan for this construction was Q.143,437.62 and paid by 70 families.

d) **Chicorral community, Santa Catarina Ixtahuacán**: Construction of a school classroom, which normally will be used for educational activities of children in the community, meetings and other social and cultural activities of the community and in emergency and/or disaster will be used as a shelter for affected people or relief items collection centre, as needed. The loan for this Q.114,349.25 with a contribution of the Municipality of Santa Catarina Ixtahuacán of Q.26,200. So the loan to the community was Q.88,149.25 , paid to the project by 20 families.

The cost differences between the 4 projects to be financed with project funds was mainly due to various aspects like geography, distances, access and logistics for transporting materials. Mainly in Chicorral this significantly increased costs. Another aspect was that the communities Chicorral and Pak'im achieved to lobby for financial support from the municipal authorities of Santa Catarina and Nahualá Ixtahuacán.

Community	*Total investment (€)*	*Municipal contribution (€)*	*Bio-rights loan and payment commitment (€)*	*Paid (€)*	*Balance to be paid (€)*	*% completion*
Pakim	18.320,34	1.461,00	16.859,34	16.859,34	12.208,38	72%
Chicorral	11.137,68	2.551,88	8.585,80	8.585,80	6.443,21	75%
Pasaquijuyub	9.069,89	0,00	9.069,89	9.069,89	8.331,32	91%
Tzamabaj	13.970,82	0,00	13.970,82	13.970,82	10.094,25	72%

The progress of the activities as contractual means of payment by community:

Pak'im community

Payment measure / unit	Committed according to agreement	Implemented	Pending	Total (estimated)
Modification of slope geometry around 27 homes	270 meters	€ 1.878	€ 0	**€ 1.878**
Maintenance of slope modification	270 meters	€ 0	€ 1.878	**€ 1.878**
Firewall rounds of 251.91 hectares	5,993 meters on 251.91 ha	€ 2.691	€ 782	**€ 3.473**
Maintenance of firewall rounds	5,993 meters on 251.91 ha	€ 1.172	€ 563	**€ 1.735**
Forest nurseries of 2,000 seedlings	2000 Units	€ 417	€ 139	**€ 556**
Agroforestry systems in 1.3 hectares	1.3 ha	€ 216	€ 0	**€ 216**
Agroforestry maintenance	1.3 ha	€ 216	€ 0	**€ 216**
Management and conservation with weeding in plantations and private plots, for 5.23 hectares.	5.23 ha	€ 974	€ 758	**€ 1.732**
Maintenance and cleaning	5.23 ha	€ 765	€ 967	**€ 1.732**
Soil conservation of 2.17 hectares: irrigation ditch, water absorption pits and terraces.	2.17 ha	€ 904	€ 0	**€ 904**
Maintenance of irrigation ditches	2.17 ha	€ 452	€ 0	**€ 452**
Implementation of 200 meters of natural barriers to stabilize terraces and irrigation ditches around 20 homes	270 meters	€ 21	€ 42	**€ 63**
Elaboration of 15 wooden nursery frameworks to improve the passion fruit production	15 units	€ 209	€ 0	**€ 209**
SUB-TOTAL measures		*€ 9.913*	*€ 5.128*	***€ 15.042***
Elaboration and validation of the DRR plan and Conservation	1	€ 974	€ 0	**€ 974**
Participation in trainings of 15 COLRED members in DRR/CCA/MRE topics		€ 382	€ 0	**€ 382**
Participation in Bio-rights and community mapping trainings		€ 362	€ 0	**€ 362**
Participation in trainings on CCA and EMR		€ 494	€ 0	**€ 494**
Awareness raising through 6 signboards with key conservation messages facilitated by community members.	6	€ 83	€ 0	**€ 83**
SUB-TOTAL capacity building		*€ 2.295*	*€ 0*	***€ 2.295***
TOTAL		**€ 12.208**	**€ 5.128**	**€ 17.337**

Chicorral community

Payment measure / unit	Committed according to agreement	Implemented	Pending	Total (estimated)
Modification of slope geometry around 20 homes	200 meters	€ 695	€ 695	**€ 1.391**
Maintenance of slope modification	200 meters	€ 348	€ 348	**€ 695**
Firewall rounds in joint and communal forest of 27.18 hectares	2100 meters on 27.18 ha	€ 737	€ 480	**€ 1.217**
Maintenance of firewall rounds	2101 meters on 27.18 ha	€ 369	€ 240	**€ 609**
Agroforestry systems of 0.6 hectares in private plots of 19 families	0.6 ha	€ 70	€ 35	**€ 104**
Agroforestry maintenance	0.6 ha	€ 70	€ 35	**€ 104**
Reforestation of 4.6 hectares	4.6 ha	€ 765	€ 0	**€ 765**
Management of private plots of 1.74 hectares	1.74 ha	€ 229	€ 348	**€ 577**
Maintenance of plot management	1.74 ha	€ 115	€ 174	**€ 289**
Soil conservation in 0.87 hectares: irrigation ditch, water absorption pits and terraces.	0.87 ha	€ 668	€ 0	**€ 668**
Maintenance of irrigation ditches	0.87 ha	€ 668	€ 0	**€ 668**
Implementation of 200 meters of natural barriers to stabilize terraces and irrigation ditches around 20 homes	200 meters	€ 14	€ 35	**€ 49**
SUB-TOTAL measures		*€ 4.746*	*€ 2.389*	***€ 7.135***
Elaboration and validation of the DRR plan and Conservation plan	1	€ 584	€ 0	**€ 584**
Participation in trainings of 12 COLRED members in DRR/CCA/MRE topics		€ 688	€ 0	**€ 688**
Participation in Bio-rights and community mapping trainings		€ 167	€ 0	**€ 167**
Participation in trainings on CCA and EMR		€ 174	€ 0	**€ 174**
Awareness raising through 6 signboards with key conservation messages facilitated by community members.	6	€ 83	€ 0	**€ 83**
SUB-TOTAL capacity building		**€ 1.697**	**€ 0**	***€ 1.697***
TOTAL		**€ 6.443**	**€ 2.389**	**€ 8.832**

Pasaquijuyub community

Payment measure / unit	Committed according to agreement	Implemented	Pending	Total (estimated)
Modification of slope geometry around 53 homes	530 meters	€ 2.281	€ 1.405	**€ 3.686**
Improvement and cleaning of storm water channels to protect the rehabilitated road.	2000 meters	€ 925	€ 0	**€ 925**
Firewall rounds in joint and communal forest of 11.94 hectares.	1500 meters on 11.94 ha	€ 869	€ 0	**€ 869**
Forest nurseries of 2000 seedlings	2000 units	€ 542	€ 14	**€ 556**
Reforestation and Management of 3.86 hectares in communal areas.	3.86 ha	€ 974	€ 306	**€ 1.280**
Soil conservation in 1.52 hectares: irrigation ditch, water absorption pits and terraces.	1.52 ha	€ 501	€ 0	**€ 501**
Implementation of natural barriers to stabilize terraces and irrigation ditches around 53 homes.	530 meters	€ 90	€ 35	**€ 125**
Elaboration of 10 nursery frameworks to improve the passion fruit production.	10 units	€ 118	€ 21	**€ 139**
SUB –TOTAL measures		*€ 6.301*	*€ 1.780*	***€ 8.081***
Elaboration and validation of the DRR plan and Conservation plan	1	€ 522	€ 0	**€ 522**
Participation in trainings of 17 COLRED members in DRR/CCA/MRE topics		€ 556	€ 0	**€ 556**
Participation in Bio-rights and community mapping trainings		€ 223	€ 0	**€ 223**
Participation in trainings on CCA and EMR		€ 647	€ 0	**€ 647**
Awareness raising through 6 signboards with key conservation messages facilitated by community members.	6	€ 83	€ 0	**€ 83**
SUB-TOTAL capacity building		*€ 2.031*	*€ 0*	***€ 2.031***
TOTAL		**€ 8.331**	**€ 1.780**	**€ 10.112**

Tzamabaj community

Payment measure / unit	Committed according to agreement	Implemented	Pending	Total (estimated)
Modification of slope geometry around 25 homes	250 meters	€ 1.356	€ 382	**€ 1.739**
Maintenance of the slope modification	250 meters	€ 417	€ 1.321	**€ 1.739**
Improvement and cleaning of storm water channels (100 meters/20 families of the central sector)	100 meters	€ 49	€ 0	**€ 49**
Maintenance of the storm water channels	100 meters	€ 24	€ 0	**€ 24**
Firewall rounds in joint and communal forest of 31.94 hectares	2235 meters on 31.94 Ha.	€ 1.294	€ 0	**€ 1.294**
Maintenance of the firewall rounds	2235 meters on 31.94 Ha.	€ 0	€ 647	**€ 647**
Forest nurseries of 2000 seedlings	2000 Units	€ 556	€ 0	**€ 556**
Agroforestry systems in 1.52 hectares private plots	1.52 Ha.	€ 160	€ 90	**€ 250**
Agroforestry maintenance	1.52 Ha.	€ 160	€ 90	**€ 250**
Management and conservation of 1.74 hectares private plots (23 families)	1.74 Ha.	€ 487	€ 90	**€ 577**
Maintenance of plot conservation	1.74 Ha.	€ 487	€ 90	**€ 577**
Soil conservation in 2.17 hectares: irrigation ditch, water absorption pits and terraces.	2.17 Ha.	€ 904	€ 0	**€ 904**
Maintenance of irrigation ditches	2.17 Ha.	€ 904	€ 904	**€ 1.808**
Maintenance of terraces	2.17 Ha.	€ 452	€ 452	**€ 904**
Improvement of the school yard with 27 meters natural and fixed barriers.	27 Linear meter	€ 7	€ 0	**€ 7**
Implementation of natural barriers to stabilize terraces and irrigation ditches around 70 homes.	700 Meters	€ 153	€ 14	**€ 167**
SUB-TOTAL		*€ 7.410*	*€ 4.082*	***€ 11.492***
Elaboration and validation of the DRR plan and Conservation plan	1	€ 1.252	€ 0	**€ 1.252**
Participation in trainings of 18 COLRED members in DRR/CCA/MRE topics		€ 626	€ 0	**€ 626**
Participation in Bio-rights and community mapping trainings		€ 264	€ 0	**€ 264**
Participation in trainings on CCA and EMR		€ 459	€ 0	**€ 459**
Awareness raising through 6 signboards with key conservation	6	€ 83	€ 0	**€ 83**

messages facilitated by community members.				
SUB-TOTAL		*€ 2.684*	*€ 0*	***€ 2.684***
TOTAL		**€ 10.094**	**€ 4.082**	**€ 14.176**

* Additionally, Tzamabaj community has made forest inventories in 4.07 hectares for the Small holder farmers incentive programme (PINPEP) of the National Forestry Institute.