

FINAL CONSULTANCY REPORT 2013



DESSIMINATION OF INFORMATION ON TWO INNOVATION TECHNOLOGY PROJECTS IMPLEMENTED IN THE TOLEDO DISTRICT AND THE FORMATION OF A NATIONAL FUNCTIONAL NETWORK IN BELIZE

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A heart full thanks to the Swiss agency and IICA/Red-Sicta for the financial support for these valuable projects executed in Central American countries, without the financial supports it would not be possible to assist the small farmers in different communities in the southern district in Belize

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Special thanks IICA`s administrator and secretary for their invaluable support rendered during the period of the project through the preparation of all documentation therefore facilitating work.

Thanks to my colleagues, liaison officers of Central America who share their knowledge in order to better execute the planned activities.

To the personnel of both non-governmental organization: Sustainable Harvest International and Ya`axche conservation Trust for actively participating in the execution of the project and for working harmoniously during the project execution.

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BACKGROUND

Red-Sicta project initiated in 2004 with the objective create favorable climate in the innovation and adaptation of new technologies that will enable small farmers achieve higher yields and better incomes in corn and beans production

Since the creation of Red-Sicta project, seven countries participated in executing innovation technology project. The project was funded by Swiss agency through the office of the Inter-american Institute for Cooperation on Agriculture (IICA) to improve the livelihood of the corn and bean farmers of Central American countries. These projects were divided into three (3) phases whereby the first phase was implemented in all Central American countries except Belize. In 2011 to 2012 the second phase was implemented in the country of Belize in San Vicente Village, Toledo district through the Caribbean Agricultural Research and Development Institute (CARDI) directed by Mr. Anil Singha. The second phase of Red-Sicta projects was concentrated in introducing post harvest technology that allowed farmers to have a better way of storing and managing corn and beans crop for better market and as results increase their income through better market prices.

In 2012 Red-Sicta saw the need of hiring a liaison officer with the objective to assist in the coordination and the implementation of the innovation technology projects and to oversee and accompany the execution of each specific project granted to different Non Governmental Organizations in Belize and through the projects creating a network that will actively participate in the solution of problems in corn and beans value chain.

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EXECUTIVE SUMMARY

The consultancy service officially started on the 29th of January 2013, where by a field visit to the village of Jalacte was done with the purpose of up-dating myself of the situation of the second phase of Red-sicta project which had recently ended and to familiarized with the farmers that worked in the second phase of the Red-sicta project.

The objective of this consultancy was to assist in the coordination and in the implementation of the innovation technology projects and to oversee the execution of each specific project granted to different Non Governmental Organizations in Belize (Ya`axche Conservation Trust and Sustainable Harvest International) and through the projects creating a network that will actively participate in the solution of problems in corn and beans value chain.

The consultancy period was for eleven (11) months, starting from the month of February and ending in the month of December 2013. In the first month, the work started with the elaboration of two innovation technology proposal that was of great concern in the corn and beans value chain. The main concern of the farmers in corn and beans production was directly related to soil conservation and it nutrition hen the two innovation project were entitled “Participatory Evaluation Of The Use Of Leguminous Cover Crops for the introduction of Slash And Mulch Systems For Sustainable Corn Production In The Toledo District, Belize ” and “Establishment of farmer field school for the Introduction of alley cropping systems to improve soil management and productivity of crops in the Toledo district of Belize”.

In order for the objectives to be accomplished two Projects was granted to Belize summing a total value of \$58,456.75 USD. The project“ Participatory Evaluation Of The Use Of Leguminous Cover Crops for the introduction of Slash And Mulch Systems For Sustainable Corn Production In The Toledo District, Belize ” which was executed by Sustainable Harvest International received \$30983.75 USD and the project entitled “Establishment of farmer field school for the Introduction of alley cropping systems to improve soil management and productivity of crops in

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the Toledo district of Belize” which was executed by Ya`axche Conservation Trust received a total of \$27,483.75 USD.

In the third phase of Red-SICTA Project, one of the objective was to massively disseminate information of the innovation technology introduced to the country through the validation of this innovation Technology in the Toledo District and through the method of Farmer Field

School and other disseminating activities planned during the project execution as stated in the proposal, hence the project had three components: A) Dissemination of Information B) Validation of experimental plots C) Monitoring and Evaluation. In this project the majority of the finance was allocated to dissemination of information, this accounted for 70 % of the total budget, while 15% for Validation and the other 15% to Monitoring and Evaluation. Along with the project, formation of a national network was required to be formed in the Toledo District that will work along with farmers to assist in finding solution to solve problem in the corn and beans value chain.

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INTRODUCTION

The lack of technology in a country has caused the citizen to lack knowledge in various sector of production; this maintains a country in disadvantage compare to others. The development of a country depends on technology and innovation. The promotion of the dissemination of information on innovation technology has been the main priority that IICA/Red-SICTA has taken charge since 2004. IICA/Red-SICTA elaborated and implemented 30 innovation technology projects in seven (7) countries which include Central America and Panama, with the view to assist small corn and beans farmers in the different countries.

In Belize two (2) innovation technology projects were implemented, one was executed by Ya`axche Conservation Trust and the other by Sustainable Harvest International. Both projects were in the concentrated on sustainable production which highly put priority in soil conservation.

The project execution served to stimulate the different actors involve in the value chain of corn and beans, and to construct a good relationship between the different stakeholders, therefore strengthening the capacity of each member involve and actively participating in assisting small farmers in their community to solve problems. Hence constructing and forming a corn and beans network.

Network is an important mechanism to promote innovation technology; hence the formation of one is of vital importance in Belize.

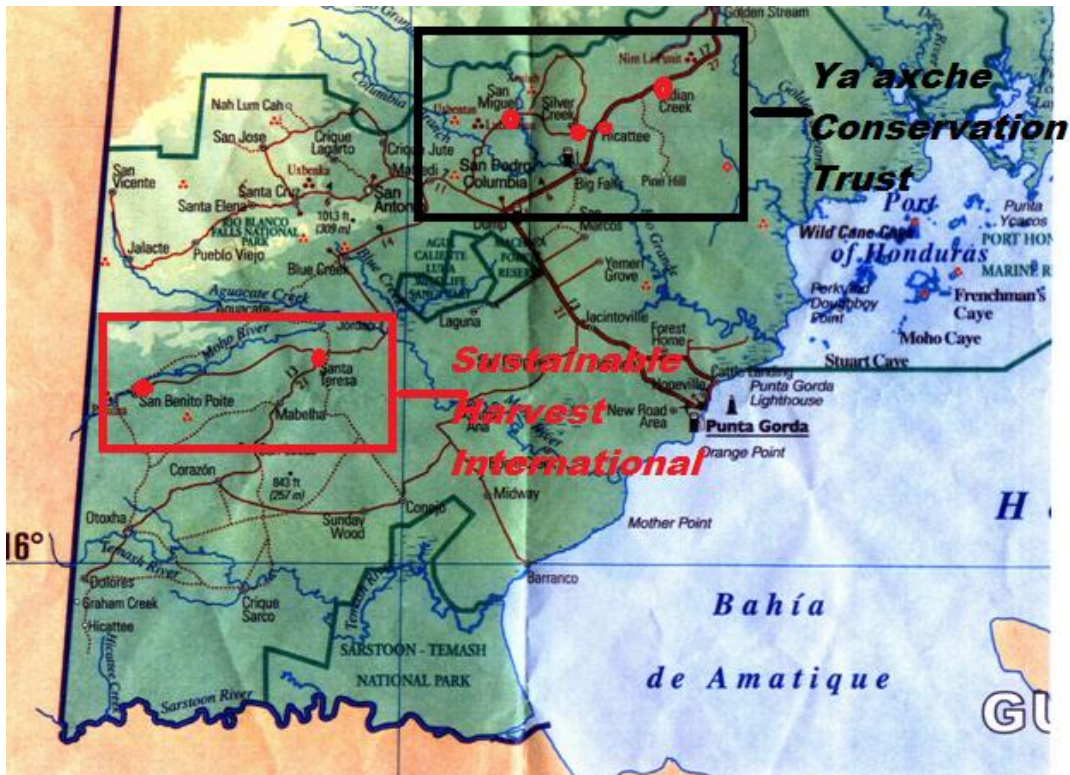
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RESULTS

Project implementation (execution)

Since the beginning of the III phase of Red-SICTA, in the month of February, the identification of capable organization that works in hand with the corn and beans farmers were identified in the southern part of the country of Belize. As indicated in the map below.

Map Showing the location of Red-SICTA Project Execution



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The nongovernmental organization are Sustainable Harvest International that executed the project entitled “Participatory Evaluation Of The Use Of Leguminous Cover Crops for the introduction of Slash And Mulch Systems For Sustainable Corn Production In The Toledo District, Belize” and Ya`axche Conservation Trust executed the project entitled “Establishment of farmer field school for the Introduction of alley cropping systems to improve soil management and productivity of crops in the Toledo district of Belize” these organization worked six different communities with farmers that had similar livelihood level of poverty, culture and belief. The communities of work, where the farmers dedicate their life in corn and beans production are: San Benito Poite, Santa Teresa, San Miguel, Silver Creek, Indian Creek and Hicatee. During the raining season the two communities that were impossible to be reached were Santa Teresa and San Benito Poite since the roads were not maintained properly and for the topography of the area, hence all the plots in the village of San Benito Poite were lost.

During the entire project the guidance and accompanied was done by the coordination committee and myself to ensure that the project is executed as stated in the proposal. 98% of the total was accomplished as set in the proposal except for the numbers of farmers and farm established as indicated. This was due to the lost of interest of the farmers since the period of planting was already over and these farmers planted before the project funding was available.

This specific project had a total of 586 beneficiaries which surpass the total number of 200 as indicated in the project. In the project four(4) farmer field school session was carried out, Five (5) technical training was conducted for sustainable harvest international personnel, four (4) field exchange activities was done with farmers and six (6) different dissemination event was carried out for the diffusion of the innovative technology to the public in general. The numbers of Beneficiaries for this Particular project surpassed the number proposed in the project executed by SHI. The project that Ya`axche executed reached to a total of 543 beneficiaries.

Sustainable Harvest International

Base on the final report of Sustainable Harvest International (SHI), the results in soil improvements was seen as much as was expected.

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*soil Microorganism

Microorganism count was conducted with all 3 farmers from Santa Teresa and 5 farmers from San Benito Poite Village. This was done in the initial stage of the project and at the end of the harvesting period for corn. Data was collected from the plot that was slashed and mulch with sample measuring 1feet by 1feet by 3 inches deep. Based on the results collected in Santa Teresa Village with the three farmers, data show that there was a large increase in the amount of earthworms and other microorganisms within the soil. The number of earthworms increased by 40% and other microorganism such as bugs and spiders saw an increase of about 47%.

In the village of Poite only one test was done with 5 farmers in the first stage of the second crop season. The reason for this is as results of crops from the first planting season were destroyed by tropical depression 2 that struck the rural villages causing massive flooding. Therefore data collected will not indicate any changes in the results obtained from the plots. In addition data was only collected from 5 farms because the remaining 4 plots have yet to be established because farmers were waiting until the end of the rainy season so as not to suffer any losses as was previously experienced.

*Water retention

A soil composition test was carried out in the experimental plots with farmers from Santa Teresa and San Benito Poite. Data shows that in the village of Santa Teresa farmers' plots mostly consisted of a silty clay soil type. This shows that soils found in this region were more water logged that in other regions because of the high quantity of clay present in the soil.

Data collected from the village of Poite revealed that the soil type present in that region were mostly of the type silty clay loam. This soil compared to that of Santa Teresa was more fertile and does not hold as much water as the amount of clay present was less than that of Santa Teresa region.

*Production and yield

In this experiment farmers were asked to conduct side by side plots in order to monitor several variables including amount of corn produced in each plot. In one plot farmers used their traditional method of burning and planting randomly and in the other plot they did not burn but mulched and planted in rows using measurements of 1 ft by 1 ft between corn plants and 3 ft between corn rows. In row planting the farmers also reduced the amount of seed per hole using only 3 as opposed to the 5 that was used in the traditional plot.

Farmers in the village of Santa Teresa maintained record keeping of their harvest and at the end the results showed that of the 3 farmers only 1 yielded better results from his slash and mulch plot with

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yield increasing by 88%. The other 2 farmers data show that their traditional methods were much more efficient and yielded better results than the slash and mulch plot. The slash and mulch plot showed a decrease in production as low as 34% compared to the plot that was burnt. The reason for such results was caused by many external indicators such as low germination rate of seeds, location of the two farms being in much lower regions of the village that is prone to floodings, no proper management, etc.

Farmers in the village of Poite yielded no production during the first planting season of the project hence there is no data to reflect whether the experimental plots were more efficient or inefficient in this region.

*% of soil cover

Mucuna beans were distributed to three of the farmers in Santa Teresa Village and one in San Benito Poite. Of the three farmers in Santa Teresa, one farmer planted his seeds but due to the intense rain they did not survive and all was lost. The remaining two farmers choose not to plant their mucuna beans and wait until the next planting season in November so that they can incorporate it within their corn field. The farmer in San Benito Poite decided to save his seeds and incorporate them into his plots near the end of the second planting season.

As a result organic matter that was measured consisted of mulch that was incorporated within the soil when the farmers cleaned their plots and slashed the plots over to prepare for the second planting season. Data was collected from a sample area measuring 1 meter by 1 meter within the slash and mulch plot. The results obtained indicate that the amount of organic matter within the plot increase by a total of 50% in the village of Santa Teresa. In the village of Poite only initial data has been collected as plots are newly established and data will not be reflected until the end of the crop cycle which will occur next year and therefore cannot be accounted for.

YAAXCHE CONSERVATION TRUST.

During the implementation of this project different activities were done to accomplish the objectives Six Farmer Field School session was done with farmers summing a total of 105. Four training session with a total of 61 farmers and three field exchange activities with 52 farmers was done. One of the major activities was the dissemination of information whereby four (4) different activities was done with a total of 282.

The project had a total of 543 beneficiaries, accomplishing the objectives of the project.

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100 soil and water conservation manual printed and distributed, 30 alley cropping T-shirt were distributed, 400 alley cropping Pamphlets printed and currently distributed and 200 alley cropping posters printed and being distributed during forum on the 21st December 2013.

Soil micro-organism count was nul (0) when the sample was taken, this was because farmers clean their land by burning the land residues after it is chopped, this is done every year. The presence of this microorganism to be present will take time. This project is a long term project, according to the consultant and specialist in this area of alley cropping, Mr Carlos Astorga, it requires at least 3 years for visible signs, and for it to be measurable.

The soil type in the villages of San Miguel, Silver Creek and Indian Creek is of silty clay soil type this was done by determining the percentage of san clay and silt through the method known as the sedimentation test and using the soil classification triangle.

Soil erosion occurred heavily especially during the last months of the project since heavy rain fall on the months of November and December. During the project it was recorded that 1.5 cm of the top layer of the soil was removed by water, this was done by setting indicator that measures the amount of soil lost. The method used was the "Nail Method" which consisted of setting pegs randomly in the field with a specific bench mark and measure every month as Shown in Ya`axche technical report.

In the month of October, farmers harvested corn from their plots and the amount harvested total is 24,565 pounds of corn. A few observations confirm that farmers who cleaned their plots manually and on time got better results than those who used chemicals and cleaned plots late.

In addition to the challenge of grass in the plots, the soil where farmers established their plots have been used many times before. Therefore their corn crop did not have many yields due to less mulch for the top soil. Moreover the weather affected the plots where some were drowned while others were affected with pests due to lot of rain.

NETWORK IN BELIZE

Farmers in Belize has always worked along with the nongovernmental organization such as Toledo cocoa Grower Association, Maya mountain Cocoa, sustainable Harvest International (SHI) and Ya`axche Conservation Trust. These farmers worked in a diversified farm, a farm where multiple corps are

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cultivated, all the farmers produce corn and beans for their family consumption. Farmers in this country had worked alone, since they are not organized into farmers group. The need of organizing farmers into group is necessary for our agriculture system to improve in all aspect in the value chain of corn and beans, therefore there was no established network operating in Belize. Belize has little knowledge of networking since every farmers works individually and none has been interested is forming a network.

During the period of the project, the time was taken to conduct meeting with various actor involved in the value chain of corn and beans with the objective to form a functional network in the southern part of Belize “Toledo” that will allow farmers to have access to better receive assistance in improving their farms and their livelihood in general, through the cooperation of one another. Three different reunions was done, the first one was in the month of May 2013 while the others were in September and November

Activity	Location	First term			Second term			Third term			Fourth term		
		E	F	M	A	M	J	J	A	S	O	N	D
First meeting conducted with potential interested key actors involved in the corn and beans value chain. to present the intention of the formation of a network. Presentation of the role of a network.	Punta Gorda, Toledo					X							
Presentation of the Red-Sicta Project, the function of the network and the role of each actor.	Punta Gorda, Toledo									X			
The meeting to make a final decision on the formation of a network and to define ways to work in network.	Punta Gorda, Toledo											X	

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On November 14, 2013 a meeting was held with all the actors involved in the value chain of corn and beans. Members of different organization such as representatives of Toledo Development cooperation (TDC) Sustainable Harvest International (SHI), Ya`axche Conservation Trust, Ministry of Natural Resources and Agriculture and other organization involved in providing agrochemicals and cooperative representatives. The presentation was geared towards the concept of a networks and it function.

The following topics were discussed during the presentation:

1. What is Red-SICTA and its objectives
2. Region of impact and operation
3. What is a network and its function
4. Example of countries and networks
5. Success of networks in other countries.

After the presentation, the floor was open for discussion, reflection or recommendation that any individual had concerning the role and involvement of the network. It was clear that all the actors wanted a network system to be fully operational and that this will allow assisting farmers to improve their livelihood.

At the end of three hours presentation and discussion the representative of Toledo conservation group past the motion for the TADA (Toledo Agriculture Development Alliance) the name of the Network, to officially work through Red-SICTA and to be the network that is needed for the Toledo District. This motion was second by Mr. Mark Chavarria, this was clear to TADA`s chairperson Mr. Candido Chun.

At the end Mr. Chun addressed all the members that form this day TADA will operated and work together with Red-SICTA.

Presently the group is comprised by various actors involved in the corn and beans value chain which are as follows:

Name	Organization	Contact
Candido Chun	SHI	7222010
Mark Chavarria	TDC	6608032
Rejinia tun	HUNANA	6361994
Andre Price	TOLCA	6327100
Ana Choco	MMC	6230600
Abner Cal	TCGA	6250099
Jose Hernandez	El Paraiso Coop.	6637522

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Kenny Cal	Ya`axche	6202594
Christina Garcia	Ya`axche	6294185
Jake Nightigale	SUMA	6679648
Flint Wagner	MNRA	7022689

All the actors work with farmers in Toledo. The group needs more guidance and a individual to assist in organizing events that are needed for the network to function properly. The experience with a functional network is not available in the country since it is the first time that this group is venturing in it.

During the year the members will invite more actors to join the network as it is the plan to have a national network in the country.

Lots of assistance will be needed to strengthen the group.

Therefore a plan was develop for the year 2014 which is directed to strengthen the newly formed network.

IDE	Actividad	Mes (fecha límite)
IDE 2	A1.1 Reunión con miembros núcleos de la red y otros actores invitados para presentar logros y establecer enfoque de la red (lluvias de ideas)	February
IDE3	Taller de capacitaciones para el fortalecimiento de las capacidades de las redes en gestión y movilización de recursos para su sostenibilidad	February
IDE4	Desarrollo de propuestas para fortalecimiento de actores en los eslabones de la cadena de maíz y frijol	August
IDE5	Reunión de actores (mesa /foro) de maíz y frijol	January-February

The sustainability of the network will only be achieved through the involvement of the Ministry Of Natural Resources and Agriculture (MNRA) since they are the organization of more influence in the

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country. It is plant that in 2014 forums will be done along with the ministry in order for them to be more involve and to take over the management of it.

CHALLENGES IN PROJECT IMPLEMENTATION

One of the major problems in the implementation of the project was the lateness in the disbursements of funds. Farmer who originally expressed interest from the onset of the project was not able to participate in the project due to the lateness of the start of the project. The planting season was already over in the month of May; June is the start of the rainy and hurricane season. However, they will participate in the matambre season with planting beginning in the second half of October.

Terrible road and weather conditions make it difficult to reach farms and thus causing a delay in proper monitoring and evaluation of experimental plots.

As a result of the tropical depression number two in Belize, a major devastation of 6 experimental plots in San Benito Poite was lost. Farmers now have to clear plot over and replant.

Another challenge for most of the farmers is not being able to read and write. Taking down notes, doing calculations and keeping records can be a hindrance to them. However, a few farmers facing difficulties brought along their sons to read and write for them. This then becomes an opportunity for the students to learn about the technology and to assist in the transfer of information.

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One of the major constrain in the implementation of the project is time dedication. The technical officer of the organization has many projects with limited staff, therefore in many occasion the officer does not have time to invest in a particular project.

Technical officers need more training in this particular Innovation since it is the first time that this innovation is being implemented and the requirement of data collection has seriously been required.

The lack of Mucuna beans is a challenge since there in none in the country. Farmers did not store the seed from the past season because many farmers do not used it in their farms therefore it is scarce.

In order for the project to be implemented in the time frame proposed, it is necessary for the organization to be receptive to follow norms and procedure set, since from the beginning of the project lots of problem was delaying the second disbursement, since this is the first time that lots of norms were set which were not clear from the beginning of the project. All roles and regulation needed to be in English, Spanish language post a barrier for following the correct procedure in recording and accounting correctly as required.

In terms of getting a network to properly function in Belize is a challenge due to the culture of the people in Toledo. Farmers are not organized in group to facilitate the process of networking.

Lack of knowledge and experience in networking post the biggest challenge for the actors to work together for a common propose.

LESSON LEARNT AND RECOMMENDATION

The implementation of the project would have been more effective if the technical staff from the organization had knowledge and experience in this type of Project.

- Training of technical personnel in the project they are undertaking (Alley Cropping and Slash and mulch) is crucial.

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- Allocation of time on the part of the technical officers is required, even though the human resources are limited in the organization to carry-out the activities plan for the months.
- More effort and support of their directors is important to effectively execute the project
- Farmers need to be grouped or to form cooperative to facilitate and partake in networks.
- It will require enough time for a national functional network to be established and to be sustainable.
- The motivation and encouragement to farmers need to be done continually to attract attention and interest in investing in their farms.
- The lobby to the Ministry of Natural Resources and Agriculture need to be done, in order to provide and to get their personnel involved in networking.

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Annex

Work Plan for the year 2013

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Phase III Annual Working Plan, Belize 2013																								
Development and management of national and regional innovation technology																								
Code	Expected Results	Achievement Indicator	Activities	Months																				
				Feb				Mar				Apr				May				Jun	Jul	Aug	Sep	Oct
				1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4					
1.1.1	ER1 Belizean Producers in the Corn and Beans value chain incorporate innovations that improve their productivity.	AI1 Technological innovations within the corn and bean value chain identified, validated and disseminated by members of the network.	A1. work with stakeholders to develop two project concepts/ideas.	X		X	X																	
1.1.2			A2. Formation of an alliance (grains committee) for the implementation of two technological innovation projects				X	X	X															
			a) Workshop with different actors to form alliance and project formulation					1																
1.1.3			A3. Develop two project proposals along with the corn and beans stakeholders.				X	X	X			X												
1.1.4		A4. Develop methodologies for the innovation technology transfer				X	X	X			X													
1.2.1		AI. 2 develop planning system for continuation and evaluation of technological innovation	A.1 participate in project preparation and execution of innovation technology .									X	X	X										
			a) workshop with different actors to prepare the execute project														1							
			A.2 set base-line for two innovation technology projects (lo realiza la Organización contraparte-administradora (Ya'che y Harvest International)														X	X	X	X				
			A.3 carry-out field visits twice a month to monitor the progress and sustainability of the project.												X	X			X	X	X	X	X	X
			a) Visit to monitor the progress and sustainability of the project.														X			X	X	X	X	X
knowledge transfer and Training in innovation technology																								
2.1.1	ER2 key actors involved in the value chain are organized through the network to share knowledge and experiences	AI. 1 strenghtening of two national networks of innovation technology	A.1 Coordinate the functioning of the network (gastos de movilización y viaticos del Enlace)	X		X	X		X	X		X	X		X	X	X	X	X	X	X	X		
			a) per dime		1		1		1		1		1		1		1		2	1	2	1	2	1
			b) traveling		1		1		1		1		1		1		1		2	1	2	1	2	1
			A.2 The operation of the national network				X		X	X		X		X		X		X		X	X	X	X	X
		A) experience exchange with farmers (Jalacte)								1														
		b) Meeting the network										1				1			1	1	1	1	1	1
2.1.2		AI.2 national networks actively involved in Innovation technology to share knowledge and	A.1 Construct strategy of dissemination of information or results throught the network							X														
			A.3 Complement the plan of knowledge with focus of value chain in Innovations technology project							X														
			AI.4 At end the phase III. Establish mechanism and sostenible process for the Innovation Technology	A.1 Define, consolidate and implements a plan for strenghtening of the network																X	X	X	X	X
			A.2 design and publish technical pamphlets for dissemination of information									X	X	X										
	a) printing technical manual- pest and disease										1													
	b) printing technical manual- conservation the water and soil										1													
		c) pamphlets / brochure alley cropping (buget from project)								1														
		d) pamphlets / brochure slash mulch (buget from project)								1														

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