



DFID Natural Resources Systems Programme

R8362 VINCOSER

Validation and communication of a community-led mechanism for livelihood improvement of remote marginalised communities in Bolivia

A collaborative project with staff from PROMETA (Tarija), the School of Geography of the University of Leeds and the University of Greenwich, Natural Resources Institute.

Livelihood impact assessment of first generation communities¹

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1. Objective

This report is based on the field research carried out between May and August 2004 as part of VINCOSER. It summarizes the more detailed analysis of the Spanish version of this report, which should be consulted for further details.

Its overall objective is to demonstrate livelihood changes which have been influenced by the different activities carried out under HEDECOM. An important focus of the analysis is the differentiated impact of HEDECOM's activities within the communities as this would reveal important conclusions for the "pro-poor" emphasis of the project. To achieve this, the report is structured in the following way:

1. Description of the different socio-economic strata within the three target communities; main characteristics of each stratum and main differences between strata; livelihood activities/strategies of the different socio-economic strata, functions and problems.
2. Characterization of the technologies promoted under HEDECOM (different categories e.g. knowledge intensive technologies, input depended technologies, etc.)
3. Analysis of the adoption and adaptation patterns of these technologies in different socio-economic strata
4. Conclusions on the contributions of HEDECOM activities to livelihood changes

2. Methodology

The research was carried out in the HEDECOM target communities Juntas, Tojo and Chorcoya. In each community an intensive field period of 20 days work was undertaken during which approximately 50% of the community households were interviewed.

Table 1. *Detailed sampling for each of the first generation communities*

	High stratum		Middle stratum		Low stratum	
	Participated in HEDECOM	Did NOT participate	Participated in HEDECOM	Did NOT participate	Participated in HEDECOM	Did NOT participate
TOJO Total interviewed: 21	4	1	7	1	8	-
CHORCOYA Total interviewed: 20	5	-	6	3	-	6
JUNTAS Total interviewed: 20	5	-	6	-	3	6

Semi-structured interviews with key informants, individuals and groups have been carried out. Since it was important to understand the reasons for which some of the community members, especially those in the lowest stratum, did not participate in the project, care was taken to select key individuals from different socio-economic strata that were participants and non-participants of the HEDECOM. The participation rate in the communities seemed to be uneven: the major reasons for this were firstly the level of organisation within the communities. While in Tojo, for instance, mostly of the people from the different socio-economic strata actively participate in the peasant union, in Juntas people in the lower stratum are highly marginalised. In other cases people in the lower stratum do not have the time or the resources to participate, this is mainly the case of single women in Chorcoya. It could be concluded that the levels of participation depend upon distances, those households living away from the centre tend to be often excluded as well as time availability, which is usually proportional to the social status and finally to the community's level of organisation, which tends to differ in different areas of rural Bolivia. In order to obtain information on the differentiated impact HEDECOM achieved within different socio-economic strata, emphasis of the research was placed on understanding the heterogeneity of the target communities. Using mainly local criteria for socio-economic differences, three main strata have been identified, which were applied throughout the research process.

Because of the lack of consistent baseline data from HEDECOM for yields, livestock performance and income and due to the short timeframe of VINCOSER it was decided not to focus on changes in measurable variables (e.g. cash, yield, soil quality, etc.) but assessed changes instigated by HEDECOM in terms of their contribution to people's livelihood activities and strategies.

We expect people from different socio-economic strata to be engaged in different livelihood activities and to have different preferences as regards their development of livelihood assets. We also expect that 'improved' livelihoods will be associated with certain broad patterns of change. Our research has therefore focused mainly on understanding the contributions of HEDECOM's activities to these broader livelihood changes. The contributions can be either direct (e.g. adding to income, health, food, etc.) or indirect (affecting people's assets, activities and options, and ability to cope with shocks).

3. Description of the different socio-economic strata within the three target communities

The description of the three different socio-economic strata is based mainly on their capital status –human, natural and physical- and the resulting livelihood strategies (see tables 2, 3, 4 and 5). The main focus was on natural resource based livelihood strategies, as this was the area of intervention of HEDECOM. However, it was also important to understand the differences in non-natural resource based strategies, as they were expected to have an important impact on overall livelihood situations.

Table 2 Human capital in the different socio-economic strata

Community and socio-economic stratum		# interviewed	HUMAN CAPITAL				
			Knowledge of current policies	Using Innovative techniques	Secondary education/ Professional training	Access to paid labour	Access to labour at home
Juntas	High	5	5	5	4	4	0
	Middle	6	4	4	4	0	6
	Low	9	0	0	0	0	9
Tojo	High	5	4	5	5	4	0
	Middle	8	1	4	1	2	5
	Low	8	2	2	0	0	6
Chorcoya	High	5	4	5	2	0	5
	Middle	9	7	7	0	0	9
	Low	6	0	1	0	0	6

- The “better off” stratum can be characterised by the relatively high level of human capital. People within this stratum seem to have a good level of knowledge of existing rights and laws, they have a solid knowledge on technologies (traditional and modern) and they have a relatively high level of formal education, which they are also achieving for their own children. Investment in education is an obvious priority. As a consequence of their educational status some of them are employed within or outside the community, have their own business (transport, accommodation, etc.) or receive pensions.

In terms of their natural resource base, they have the largest areas of cultivable land with access to irrigation, which have either been inherited or acquired over time. Cultivated areas vary within and between the communities, however, a relevant difference to the other strata is the access to irrigation water, which influences their production pattern and makes them less vulnerable to climatic events. Whereas in Chorcoya field crops are important, in Tojo and Juntas fruit tree and grape production are additional important activities.

In terms of livestock production there are clear differences between the three villages. Whereas in Chorcoya mainly sheep and goats (> 300), cattle (> 20) and llamas (> 10) are kept, in Juntas an emphasis within this stratum is on cattle including cows for the production of milk and cheese. In Tojo livestock does not play an important role for this stratum, which is reflected in the number of households of the “better off” that have only small animals.

In terms of physical capital the “better off” have access to irrigation systems, which as said previously has a major impact on their cropping pattern and products. Their houses are of solid structure, good in size and often in central locations, which allow for a better access to all types of services.

Livelihood strategies in this stratum are based on agricultural production for home consumption and to sell and the transformation of products, which can be sold in the urban areas or to people travelling through the communities. Income is complemented, especially in Juntas and Tojo, through local services such as transport, hiring out of cattle for ploughing, shops, etc. or through salaries obtained outside the community (including pensions). In this stratum the livelihood activities are the most diversified compared to the

other strata, which in turn reduced their vulnerability to external shocks, such as climatic events or negative changes in markets.

Table 3 *Natural capital in the different socio-economic strata*

Community and socio-economic stratum		NATURAL CAPITAL					Crops in order of importance
		Livestock			Land		
		Cattle	Sheep	Goats	Irrigated	Non-irrigated	
Juntas	High	<25	-	<25	2.5 ha	2.5 ha	Potatoes, corn, onion, vegetables, peanut, fodder, and fruit trees in a small scale
	Middle	<20	-	<15	2 ha	3 ha	Corn, potato, peas, onion, and peanuts
	Low	<3	<3	<10	¼ ha	¼ ha	Corn, potato, peas, onion, peanuts, amaranth, wheat
Tojo	High	-	-	-	< 1 ha	-	Corn, grape, quince/alvarillo, potato
	Middle	-	> 20	-	¼ -1 ha	-	Corn, grape, potato, alvarillo/quince
	Low	-	> 5	-	> ¼ ha	-	Corn, grape
Chorcuya	High	<20	<300	-	2ha		Potatoes, haba, vegetables, garlic, camomile, barley, cebollonions
	Middle	5-10	100-300	-	>1 ha	Very limited	Potatoes, haba, vegetables, garlic, camomile, barley, onions
	Low	1-5	20-50	-	-	¼ ha	Potatoes, vegetables

- The “middle” socio-economic stratum is that where most people are situated in the three communities. In terms of human capital there is a noticeably lower level of formal education, which will also continue in future generations, as children are often included into the productive process and have therefore more limited possibilities to continue their education beyond the primary stage. Also in terms of knowledge of existing laws and rights people within this stratum are less informed.

In terms of natural capital this stratum is characterised by smaller land holdings often ranging between 0.25 and 1 ha of which the majority is without access to irrigation. In terms of livestock a similar tendency is noticeable. Cattle, sheep, and goats are kept, however in smaller numbers. Fruit trees and grape production also seem to be less relevant although there are differences between villages.

The livelihood strategies of this stratum are based on crop and livestock production for subsistence. Exchanges of agricultural products take place to acquire products which are not produced in their community. Only in the case of a large production surplus is some sold to traders or in city markets.

In households where labour is a limiting factor (e.g. female-headed households) for agricultural production, women tend to sell food at the roadsides to complement household income. Furthermore migration is a very common phenomenon in this stratum.

Table 4 *Physical capital in the different socio-economic stratum*

Community and socio-economic stratum		# interviewed	PHYSICAL CAPITAL			
			Access to services	Access to main road and public transport	Multi-room house with facilities	Others
Juntas	High	5	5	5	5	Access to team of oxen, gas cooker
	Middle	6	6	6	6	Access to ox team
	Low	9	1	0	0	
Tojo	High	5	5	5	5	2 have trucks 2 have hotels and shops
	Middle	8	5	5	4	
	Low	8	5	5	2	
Chorcuya	High	5	0	3	4	2 have trucks
	Middle	9	0	1	2	
	Low	6	0	0	0	

- The lowest stratum can be described in terms of its human capital as lacking formal education to a degree that many are functionally illiterate and are not aware of existing laws and rights. In terms of labour availability these households experience a shortage of available labour, as they are either female-headed households with a large number of dependent children, or elderly people or household members with other problems such as alcoholism or physical impairments.

In terms of natural capital these households are very similar across the three villages. Their land holdings are small (< 0.25 ha) or they are landless, which in some cases is overcome by working on other family or community members land for subsistence production. This stratum similar to the other two strata combines crop production with livestock production. However, the numbers of animals are limited and there is a clear dominance of sheep and goats, rather than cattle.

In terms of physical capital these households often do not have access to irrigation, which limits their agricultural production. They live in small houses, which are located away from the village with limited access to services.

Their livelihoods are based on agricultural production for consumption. However, as their natural assets are limited, they have to complement their production with income derived from other sources. They either migrate to Tarija, the eastern lowlands or Argentina to work, they sell their labour within the communities to the better-off stratum, or they sell food alongside the roads. As they depend more on selling their labour, they are less vulnerable to climatic events, which may destroy the harvest.

Table 5 *Livelihood strategies in the different socio-economic strata*

		LIVELIHOOD STRATEGIES

Community and socio-economic stratum		# interviewed	Invest large part of their income in farming and livestock production	Migrate	Work for wages	Others
Juntas	High	5	5	0	0	-5 receive alternative source of income -5 invest in their children's education -3 process part of their produce
	Middle	6	5	6	5	-6 sell part of their production -5 sell/exchange products at local fairs
	Low	9	All invest just in basic inputs	0	9	-9 live from self-production
Tojo	High	5	5	1	0	-1 offer services such as a hotel or shop -3 add value to products -2 sell rabbits -5 receive alternative source of income
	Middle	8	0	5	4	-1 sells rabbits -3 sell bread or food
	Low	8	0	2	5	-6 Sell food
Chorcoya	High	5	3	1	1	-3 their children send money -All sell crafts -2 give service with truck -All invest in their children's education
	Middle	9	1	5	2	-All sell crafts -2 sell manure
	Low	6	0	4	1	-All sell crafts

4. Characteristics of the technologies promoted under HEDECOM

The HEDECOM project selected the three communities based on a 10 year previous research history, in which their problems had been identified through “integral appraisals” together with the communities. These appraisals identified fruit production and livestock production as key areas where outside knowledge was needed. Based on those findings HEDECOM identified technical practices which could help to overcome the identified problems. These practices were promoted by local professionals.

The practices included:

- Fruit tree disease control and management (especially focused on grape vines and peach trees) including biological and integrated pest management practices, grafting and pruning.
- Experimentation with alternative crops, including legumes and improved varieties of local crops³
- Restoration of old terraces⁴
- Livestock health and management, including vaccination, de-worming and other practices.
- Participatory/ consultative research in livestock diseases.

The methods used to promote these practices included workshops, training sessions, practical work with individuals and groups, distribution of materials and inputs, and the distribution of flyers and other training materials, etc.

A more detailed analysis of the promoted practices based on observations in the fields and interviews with household members of the three communities revealed a number of criteria which can be applied to distinguish between these practices.

- Dependence on external inputs, which require a financial and logistical effort to purchase them (e.g. vaccinations, de-worming, etc)
- Based on high labour input (e.g. pruning and grafting, biological pest control, etc.)
- Based on existing resources of the practising households (restoration of terraces)
- Based on intensive knowledge sharing and learning process (e.g integrated pest management, livestock breed improvement, etc.)
- Requirement of social organisation for successful implementation (integrated pest management)

This distinction is important to better understand the adoption patterns of these practices. Depending on the resource situation of the households and their livelihood strategies some of these practices will fit better than others. In some cases they may not fit or respond to the households' resource situation and preference at all.

5. Conclusions on contributions of HEDECOM activities to livelihood changes

Before we look in more detail at the adoption patterns and the implications for people's livelihoods we need to define the term itself. In this study we refer to adoption as the *successful* integration of a *new* practice into the production system. Successful means that the practice remains part of the production system over a longer time, which may also include a process of adaptation of the practice. Adaptation is a very important aspect in the adoption process, as it enables individuals to make a practice fit better to existing resources and needs.

³ These practices were only introduced in one of the three communities

⁴ Idem.

VINCOSER had the opportunity to revisit the participants of the HEDECOM project to understand better who adopted successfully which practice and to identify factors which affected the adoption process.

The project findings showed a lack of sustainability of the adoption process across the three strata (see tables 6 and 7 for evidence supporting these conclusions). One year after the end of the HEDECOM project less than 50 % of the households who had initially participated continued with the promoted practices for various reasons:

- During the last two years climatic events like hail, drought and frost have had a negative effect on yields and production patterns, which may have contributed to the abandonment of new practices, as their benefits could not be perceived by the people. However, in regions where these climate events are part of the agro-ecosystem, it is important to take these into account in technology selection and promotion.
- Some of the promoted practices relied on external inputs or services which were delivered free of charge from the local professionals. This always implies the risk that people are not willing or able to pay for these after the project withdraws.
- In some of the villages there was a clear lack of community organisation, which influenced negatively the adoption of technologies, which relied on a community response, such as integrated or biological pest management. The project should either have focused more on strengthening the social organisation, or if this seemed impossible, not have promoted practices which depend on it.
- The HEDECOM project did not seem to have a clear project exit strategy. HEDECOM did not link the communities to other alternative service providers, which could have given continuity to the process. This had a negative impact in terms of adoption rates and also in terms of diffusion of practices within the communities.

Based on the information obtained in this research we can conclude that the adoption of the practices promoted by HEDECOM is not equally distributed.

First of all the three socio-economic strata showed clear differences in terms of adoption rate: The adoption pattern shows clearly that the highest adoption rate took place in the “better off” stratum, followed by the middle stratum. The adoption rate and so the impact of the practices on livelihoods within the lowest socio-economic stratum has been very limited. Households of the “better off” and “middle” strata benefited most from the HEDECOM project. This is partly due to their better resource situation, which enables them to invest in a range of production activities, partly due to their higher ability to take risks.

Secondly, some of the production areas targeted by the project had a more positive adoption rate of promoted practices than others. The highest adoption rate was seen in practices relating to fruit tree production. This applies only to the “better off” and middle strata.

Table 6 Adoption rates in fruit production

Community	Stratum	# participated	Adoption rates in fruit production		
			Disease treatment	Propagation	Pruning
Juntas	High	5	2	2	5
	Middle	6	1	4	2
	Low	3	0	0	0
Tojo	High	4	3	2	5
	Middle	8	4	3	8
	Low	8	1	2	3

Table 7 Adoption rates in livestock management

Community and socio-economic stratum		# Participated	Adoption rates any livestock management practice
Juntas	High	5	4
	Middle	6	2
	Low	3	0
Tojo	High	5	1
	Middle	7	0
	Low	8	3
Chorcoya	High	5	5
	Middle	6	4
	Low	0	0

Table 8. Adoption rates of farming techniques in Chorcoya

		No. participants	On field trials	Terraces
Chorcoya	High	5	3	1
	Middle	9	1	2
	Low	0	0	0
TOTAL		14	4	3

Table 9 Overall adoption rates in all communities

(Percentage of participants adopting)

Stratum	Fruit production	Livestock management
High	66	67
Middle	33	51
Low	13	25

Thirdly, there were differences between the communities. For the interventions in fruit tree production for instance we conclude that, across all strata, the adoption rate was significantly higher in Tojo, more reliant on fruit production in comparison with Juntas.

The findings above show the importance of considering the differentiated impact of technology promotion. Very few technologies can be considered as neutral in terms of socio-economic impact and resource requirements. Without taking into account the different needs and priorities within rural communities, successful adoption of new practices will be limited. An apparent failure of the HEDECOM project was not to take into account this differentiated impact of technologies on peoples livelihood.

Appendices

Appendix 1

Tables 9, 10 and 11 systematise the data supporting the evidence on adoption rates, reasons for adopting or not adopting are given too.

Table 9 Adoption rates in fruit management techniques

Social Stratum	Fruit tree management	REASONS FOR ADOPTING	REASONS FOR NO ADOPTING	EXPECTED IMPACT
HIGH STRATUM (A)	Control of fruit fly -In Tojo out of 5, one adopted -In Juntas out of 5, none adopted	The only person that still practises all the techniques is a single middle age man, whose daughters and sons live in the city, and who has always shown great interest in fruit tree management. He has 700 young peach trees, and sells a relatively big part of the production.	Some of the comments were: -There is no time, the inputs are hard to get, and is not worth it because for us is not a priority - Soil removal around the trees must take place in May, however farmers wait until June so livestock clear the grass around the trees	Finish with the fruit fly so harvests increase
MIDDLE STRATUM (B)	-In Tojo out of 8, none adopted -In Juntas out of 6, none adopted	-	Some of the comments were: -In Tojo, it is not a priority for them since they do not depend a great deal on peaches, furthermore they do not buy the inputs -In Juntas they didn't adopt it because is not a priority, they don't have many fruit trees and they invest their time in other activities	
LOW STRATUM (C)	-In Tojo out of 8, none adopted -In Juntas out of 9, none adopted	-	Some of the comments were: -In Tojo, they didn't adopt because some single women could not attend the training courses -Because no everyone in the community does, and others get down -Not everybody has access to resources for doing so, either land or water or access to inputs -Because is not a priority	
A	Control of spider in fruit trees -In Tojo out of 5, 3 adopted -In Juntas out of 5, none adopted	The three people still practising have a high number of young peach trees, some pay for extra labour, they sell their production and one of them sprays just with water	Some of the comments were: -Since they have not seen results they have not continued doing	Finish with the spider so harvests increase

Social Stratum	Fruit tree management	REASONS FOR ADOPTING	REASONS FOR NO ADOPTING	EXPECTED IMPACT
B	<ul style="list-style-type: none"> -In Tojo out of 8, 4 have adopted -In Juntas out of 6, 1 still carries out 	<ul style="list-style-type: none"> - From these people one is a leader for a fruit producer association, so he is fairly interested in the matter; another one has a lot of interest too; and the remaining two are single women who pay extra labour for doing so. They use shampoo and tabaco because there is no money for other inputs -In Juntas, the one carrying out is single, and does it as a hobbie because he does not have many trees <p>The adopter is a woman with a small piece of land which her parents gave her and is the brother who practices it</p>	<p>Some of the comments were:</p> <ul style="list-style-type: none"> -In Tojo those non adopters do not have many trees -The rest of the community does not practice -Others did it for a couple of years and saw no results so gave up -In Juntas they do not have fruit trees -Lack of time -Is not a priority 	
C	<ul style="list-style-type: none"> -In Tojo out of 8, just one adopted -In Juntas out of 9, none adopted 		<p>Some of the comments:</p> <ul style="list-style-type: none"> -In Tojo Because some of the women are single mothers and have no time -Because they can't see immediate results -Because they don't have trees -In one case they got negative results -In Juntas is not a priority -Others don't have fruit trees -Others didn't attend the training course <p>The same as the previous one</p>	
A	<p>Control of taladro</p> <ul style="list-style-type: none"> -In Tojo out of 5, 3 adopted -In Juntas out of 5, 3 adopted 	<p>The same as the previous one in Tojo</p> <p>In Juntas some did before HEDECOM and others are keen because another Project now is difusing similar techniques (SEDAG)</p>		The same as before
B	<ul style="list-style-type: none"> -In Tojo out of 8, 4 adopted -In Juntas out of 6, none adopted 	<ul style="list-style-type: none"> - From these people one is a leader for a fruit producer association, so he is fairly interested in the matter; another one has a lot of interest too; and the remaining two are single women who pay extra labour for doing so 	<p>Some of the comments:</p> <ul style="list-style-type: none"> -Because some are single women with no time -Because they don't see immediate results -Because they have no trees and because it has got worse 	
C	<ul style="list-style-type: none"> -In Tojo out of 8, there is no adopters -In Juntas out of 9, none practices 	-	<p>Some of the comments:</p> <ul style="list-style-type: none"> -In Tojo the is no adopters because they can't afford inputs, or don't have trees -Because the person who was trained has migrated -Because there exists the feeling that after developing the practice the harvests didn't improve -In Juntas they didn't adopt because they don't have trees and others didn't know about the project 	

Social Stratum	Fruit tree management	REASONS FOR ADOPTING	REASONS FOR NO ADOPTING	EXPECTED IMPACT
A	Pruning -In Tojo out of 5, they all adopted -In Juntas out of 5, all adopted	Before HEDECOM they already practice this technique, which they understand as getting rid of death or old branches (this has been verified through field walks)	-	Strengthen the tree so as to increase production
B	-In Tojo, out of 8, all adopted -In Juntas out of 6, 2 practise	Before HEDECOM they already practice this technique, which they understand as getting rid of death or old branches		
C	-In Tojo, out of 8 just 3 adopted -In Juntas out of 9 none adopted	Before HEDECOM they already practice this technique, which they understand as getting rid of death or old branches Those practising had a lot of experience and were knowledgeable in fruit tree management	Some of the comments were: -Those that don't practice didn't have trees -Others didn't know about the project	
	FRUIT TREE RENEWAL			
A	Fruit nurseries -In Tojo out of 5, one had trees -In Juntas out of 5, 2 had trees	In Tojo the adopter had a lot of interest and sells his fruit production In Juntas the adopters had plenty of time and a few of the trees survived	Some of the comments were: -In Tojo most of them died with the draught -In Juntas el vivero was badly designed, seedlings were narrowly planted and they were taken out too late so all the roots were broken apart	Tree renewal
B	-In Tojo out of 8, 3 still have trees -In Juntas out of 6, 2 still have trees	In Tojo, there does not seem to be a reason of why they still have trees In Juntas, there doesn't seem to be a reason neither	The rests's trees died In Juntas the vivero was badly designed	
C	-In Tojo out of 8, none has trees any longer		There are no reasons, one said because of aunts	
A	Grafting -In Tojo out of 5, two still practice it -In Juntas out of 5, two still practice	In Tojo one of the female adopters is paid very little money so she prefers investing her time in more rewarding activities such as bread making; the other one knew how to do before the Project but he had another technique In Juntas already know how to do it and the other one practices as a hobby	Many didn't learn because it seemed difficult, furthermore according to them they can pay others to do so. Others say they are old and can't see properly	Old tree renewal

Social Stratum	Fruit tree management	REASONS FOR ADOPTING	REASONS FOR NO ADOPTING	EXPECTED IMPACT
B	-In Tojo out of 8, 3 still practice it -In Juntas out of 6, 4 learnt how to do it	In Tojo the ones still practising is mainly because they have the ability and enjoy it From the 4 that learnt not all still practice, they learnt because they had the ability and because they enjoyed it	No reasons why they don't practice it anymore	
C	-In Tojo out of 8, 2 learnt -In Juntas out of 9 no one practices	One of this people does it for other community members, but she claims that she won't do it anymore because they pay her very little	The ones that don't practice is because they don't have trees or because didn't get to participate in the project	

Table 10. Adoption rates in livestock management

Social Stratum	LIVESTOCK	REASONS FOR ADOPTING	REASONS FOR NON ADOPTING	EXPECTED IMPACT
A	Injecting, measuring doses and vaccinating -In Chorcoya out of 5, 1 seems to have learnt to vaccinate during the Project -In Tojo out of 5, 1 still practices -In Juntas out of 5, 2 still seem to be interested	-In Chorcoya not all families knew how to vaccine, the project's remedies were high quality and were given at half prize -Before Tojo's adoptant didn't know how to inject, now he does it himself. This farmer has access to inputs and doesn't have a lot of livestock -In Juntas both farmers referred to deworming as the project's most important contribution	-In Chorcoya, and given the importance of livestock as a livelihood strategy, vaccinating was and old established strategy, they often have local professionals within the community in charge of this activity, and have a well established self-sustaining economic system for accessing the inputs. Therefore farmers trust the LPs for undertaking this activity -In Tojo this stratum hardly depends on livestock for living -In Juntas, they already practised, they had a self-sustaining economic system	-Improve livestock's health so they can get better quality milk and meta, selling it more expensive into the market
B	-In Chorcoya out of 9, 1 learnt this technique -In Tojo out of 8, none practised -In Juntas out of 6, 1 still practices	-The same as before -In Juntas the adopter didn't have much livestock	-In Chorcoya the Project didn't reach some households. These two last years livestock was negatively affected by drought. Single women did not always participate. Some people are reluctant with regards to vaccination. The project vaccinated mostly high stratum's people's livestock -In Tojo, although they learnt or tried to, hardly anyone practices any longer either because they have forgotten or because they can't access inputs -In Juntas some knew already and others keep paying the local professional, they say as well that the Project didn't stay enough time in the community and it should have done a follow up	

Social Stratum	LIVESTOCK	REASONS FOR ADOPTING	REASONS FOR NON ADOPTING	EXPECTED IMPACT
C	<ul style="list-style-type: none"> -In Chorcoya out of 6, none of them had participated -In Tojo out of 8, 3 learnt but do not practice any longer -En Juntas out of 9, none practices any longer 	<ul style="list-style-type: none"> -In Tojo, a female participant has vaccinated the neighbours' livestock but it has been paid very little 	<ul style="list-style-type: none"> -In Tojo some are single women and were their husbands who were trained by the Project. Mainly they do not vaccinate because of lack of inputs -Many didn't participate in the Project and the rest do not have cattle -They just vaccinate when any of their goats gets very ill 	
A	<ul style="list-style-type: none"> Research on livestock disease -In Chorcoya out of 5, all of them liked the research -In Tojo out of 5, none knew about the research -In Juntas out of 5, 2 mentioned this activity 	<ul style="list-style-type: none"> -In Juntas the most helpful activity was the research made for a disease called 'mal de orina' 	<ul style="list-style-type: none"> -In Chorcoya the research didn't conclude in any practical solutions, and the information has not been made available to other institutions -The same problem as in Chorcoya 	The same as the previous one
B	<ul style="list-style-type: none"> -In Chorcoya out of 9, 4 did mentioned it -In Tojo out of 8, did not know about any research in Tojo -In Juntas out of 6, two mentioned it 	<ul style="list-style-type: none"> -In Juntas the same as before 	<ul style="list-style-type: none"> -The same as before 	
C	<ul style="list-style-type: none"> -In Chorcoya out of 6, none had participated -In Tojo out of 8, none knew about research going on in Tojo -In Juntas out of 9, none mentioned it 		<ul style="list-style-type: none"> -In Juntas in this stratum just the people from the area called Josepillo participated, but in this area they just have goats 	
A	<ul style="list-style-type: none"> Castration, cura de ombligos, descole -In Chorcoya out of 5, 4 already practised these techniques before the Project -In Tojo out of 5, none practised -In Juntas out of 5 just one had adopted 		<ul style="list-style-type: none"> -In Chorcoya one person mentioned that they already did but the project's methods were 'more professional' -In Tojo this stratum does not depend on livestock 	The same as the previous one

Social Stratum	LIVESTOCK	REASONS FOR ADOPTING	REASONS FOR NON ADOPTING	EXPECTED IMPACT
B	<ul style="list-style-type: none"> -In Chorcocoya out of 9, 10 already practised these techniques before the Project -In Tojo out of 8, none had adopted -In Juntas out of 6, none had adopted 		<ul style="list-style-type: none"> -In Chorcocoya the same as the previous one 	
C	<ul style="list-style-type: none"> -In Chorcocoya out of 6, none had participated -In Tojo out of 8, none had adopted -In Juntas out of 9, none had adopted 		<ul style="list-style-type: none"> -In Chorcocoya they already practised these techniques -In Tojo they already practised, some said that now they understood better the reasons for adoption 	
A	<ul style="list-style-type: none"> Improved hens mini-project -In Tojo out of 5, 2 still have them 	<ul style="list-style-type: none"> -En Tojo, estas señoras ya tenían muchas gallinas y tienen insumos para medicamentos, alimento balanceado y para reponerlas -In Tojo, the mini-project worked through the local mother's association 	<ul style="list-style-type: none"> -In Tojo, the non-adopters is because they didn't belong to the mother's association 	The same as in the previous one
B	<ul style="list-style-type: none"> -In Tojo out of 8, 2 participated in the mini-project and none has hens any longer 		<ul style="list-style-type: none"> -Ya no tienen gallinas porque se murieron de enfermedad contagiando a las criollas 	
C	<ul style="list-style-type: none"> -In Tojo out of 8, 2 participated in the mini-project and none has hens any longer 	<ul style="list-style-type: none"> The same as in the previous one 	<ul style="list-style-type: none"> The same as in the previous one 	
A	<ul style="list-style-type: none"> Improved goats mini-project -In Juntas out of 5 none adopted 		<ul style="list-style-type: none"> -The Project was targeted to the lowest strata's households in Josepillo, however one of the conditions was for them to lend the goats males to other community members. Now the goats' owners do not want to lend them, causing problems between neighbours 	
B	<ul style="list-style-type: none"> -In Juntas out of 6, two adopted 	<ul style="list-style-type: none"> -One of the adopters lives in Josepillo and belongs to the medium strata level because of the large number of goats that it has -The other one got involved with the Project because he owns a small piece of land in Josepillo, however he lives near the center 		
C	<ul style="list-style-type: none"> -In Juntas out of 9, two adopted 	<ul style="list-style-type: none"> -The adopters are from the lowest strata, they feel satisfied with their improved goats, they vaccinate them and follow all the projects instructions for their maintenance 		

Table 11. Adoption rates in farming techniques, Chorcoya

Social Stratum	Interventions in agriculture	Reasons for adopting	Reasons for non adopting	Expected impact
A	On field trials -In Chorcoya out of 5, 3 still practised	-They enjoyed the trials mainly because they had access to certified seeds	-Some did not enjoy working in groups, they prefer to do it individually -Certified seeds are hard to obtain	-Not clear since they already used the potato varieties that the project introduced
B	-In Chorcoya out of 9, just one continued with the trials	-According to him, the trials are time and effort consuming and not everyone in the community gives priority to agriculture	-Some have hardly any land, others are single women with time constraints, others think that the amount of seeds given by the Project is insufficient, therefore the trials are unsustainable, others thought that the Project benefited just a small elite, water scarcity was another problem, as well as agriculture not being the main priority	-Not clear
C	-In Chorcoya out of 6, none participated	-	-	-
A	Terraces -In Chorcoya out of 5, 1 participated	-	-The Project did not seem to have continued due to an internal mismanagement	-It was expected that terraces would protect crops from the wind, and would help to better maintain water resources
B	-In Chorcoya out of 9, 2 participated in the Project	-	The same as before	The same as before
C	-In Chorcoya out of 6, none participated	-	-	-