Nombre	Apellido	Localidad	Nª caj.inicio	Nª caj.final
Julio	Miranda Roa (Testigo)	Santaní	1	1
Alberto	Miranda Roa	Santaní	1	8
Basilio	Miranda Raimondi	Santaní	1	10
Bernardo	Miranda	Santaní	3	15
Migdonio	Benítez Miranda	Santaní	4	16
Francisca Isidora	Martìnez Barreto	Atyra	10	3
Emilio	Jimenez Martinez	Atyra	10	10
Estanislao	Fernández Giménez	Atyra	10	10
Eulalio	Ibarra Giménez	Atyra	10	7
María Emma	Molina	Atyra	2	5
Milciades	Vera	Sapucai	8	39
Heliodoro	Torres Espínola (Testigo)	Sapucai	2	8
Gloria Mercedes	Ferrariño de Díaz	Sapucai	3	8
Juan Pablo	Contrera	Sapucai	0	0
Cesar Raul	Cristaldo	JM Frutos	10	30
Eugenio	Gauto	JM Frutos	15	22
Miguel Angel	Estigarribia	JM Frutos	15	35
Ovidio	Gauto	JM Frutos	22	30
Pedro Carlos	Madsen Gauto (Testigo)	JM Frutos	19	19
Francisco Anuncio	Vera Silvero	JM Frutos	2	9
			148	285

Name, Surname, Location, Nr. of initial beehives, Nr. of final beehives

5. – With respect to the **money income** averages obtained by sales of produced honey, the higher per capita income of the JM Frutos producers stands out (up to a maximum of 9.000.000 guaraníes), which complement other incomes obtained by out of farm activities. All but two informants declared to have other incomes, earned neither from farming nor from beehive production. In the case of Calle Bertoni, income from honey sales complements those generated from cash crops. In the Sapukai and Atyrá Committees, the first harvest of honey is still expected in the present season. In general, the data of obtained income correspond to the harvest of honey in 2006.

The calculations do not include the beekeepers interviewed controls, who are not members of the Committees attended by the Project

In the following table, detailed information per interviewed informant is presented:

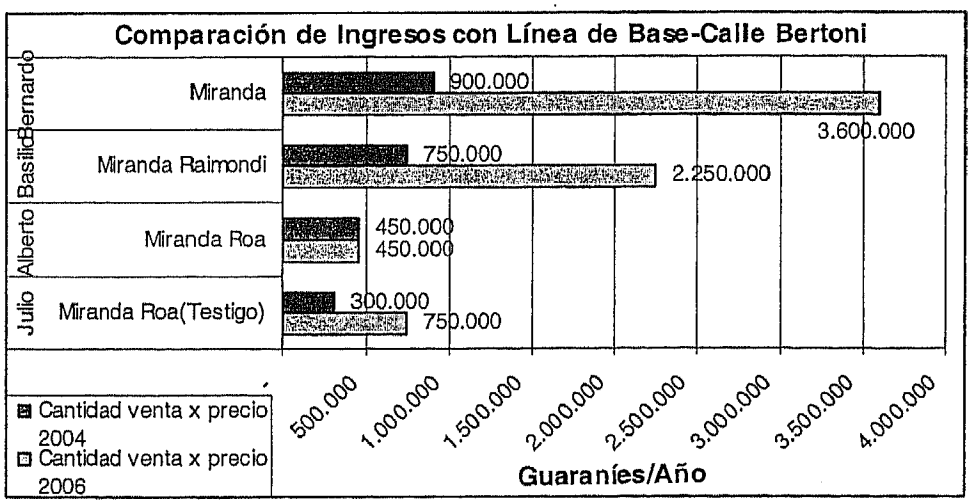
When the income originated by sale of honey between the year 2006 and the 2004 base line are compared, it is observed large increases in most cases, being superior the values of those obtained in JM Frutos, even though two honey producers sold less than in 2004.

Nombre	Apellido	Localidad	Cantidad venta x precio	Promedio	Otras actividades extraprediales
Julio	Miranda Roa (Testigo)	Santaní	-	25 Lt/consumo	Docente
Alberto	Miranda Roa	Santaní	750.000		Docente
Basilio	Miranda Raimondi	Santaní	450.000		-
Bernardo	Miranda	Santaní	2.250.000		Albañilería
Migdonio	Benítez Miranda	Santaní	3.600.000	1.762.500	-
Francisca Isidora	Martìnez Barreto	Atyra	-	No aplicable	Docente
Emilio	Jimenez Martinez	Atyra	-	No aplicable	Olerìa
Estanislao	Fernández Giménez	Atyra	425.000		Constructor
Eulalio	Ibarra Giménez	Atyra	-	No responde	Docente
María Emma	Molina	Atyra	-	No vendió.	Fisioterapeuta
Milciades	Vera	Sapucai	-	No vendió.	Asalariado
Heliodoro	Torres Espínola (Testigo	Sapucai	1.040.000		Leña
Gloria Mercedes	Ferrariño de Díaz	Sapucai	-	No vendió.	Almacén
Juan Pablo	Contrera	Sapucai	-	No aplicable	Asalariado
Cesar Raul	Cristaldo	JM Frutos	9.000.000		Farmacéutico
Eugenio	Gauto	JM Frutos	5.208.000		Relojero
Miguel Angel	Estigarribia	JM Frutos	1.400.000		Olero
Ovidio	Gauto	JM Frutos	8.975.000		Fabrica colmenas
Pedro Carlos	Madsen Gauto (Testigo)	JM Frutos	1.800.000		Maderero
Francisco Anuncio	Vera Silvero	JM Frutos	600.000	5.036.600	Fotógrafo

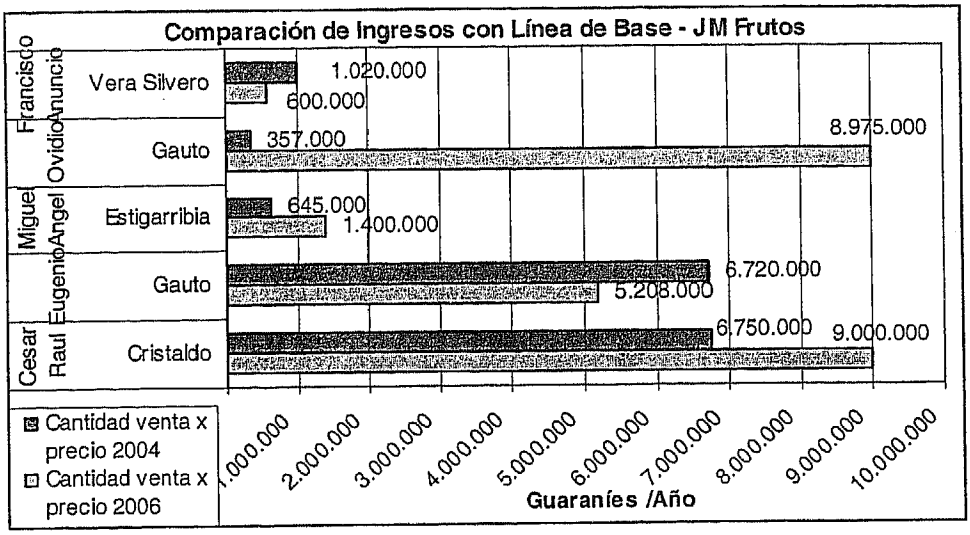
Name, Surname, Location, Sale qty. x price (Gs.), Average, Other activities out of farm: (teacher (docente), brick maker (olerìa), mason (albañileria), physiotherapist, wage earner (asalariado), wood/logging (maderero,leña), food retailer, Clock repair (relojero), beehive maker (fabrica colmenas), photographer.)

		Localidad	Cantidad venta x precio 2006	Cantidad venta x precio 2004	Diferencia Gs.	Diferencia %
Julio	Miranda Roa(Testigo)	Santaní	-	No aplicable	No aplicable	No aplicable
Alberto	Miranda Roa	Santaní	750.000	300.000	450.000	250
Basilio	Miranda Raimondi	Santaní	450.000	450.000	-	100
Bernardo	Miranda	Santaní	2.250.000	750.000	1.500.000	300
Migdonio	Benítez Miranda	Santaní	3.600.000	900.000	2.700.000	400
Promedio			**1.762.500**	**600.000**	**1.162.500**	**294**
Cesar Raul	Cristaldo	JM Frutos	9.000.000	6.750.000	2.250.000	133
Eugenio	Gauto	JM Frutos	5.208.000	6.720.000	- 1.512.000	78
Miguel Angel	Estigarribia	JM Frutos	1.400.000	645.000	755.000	217
Ovidio	Gauto	JM Frutos	8.975.000	357.000	8.618.000	2.514
Francisco Anuncio	Vera Silvero	JM Frutos	600.000	1.020.000	- 420.000	59
Pedro Carlos	Madsen Gauto (Testigo)	JM Frutos	1.800.000	No aplicable	No aplicable	No aplicable
Promedio			**5.036.600**	**3.098.400**	**1.938.200**	**163**

Name, surname, location, Qty. of sales x 2006 prices, Qty. of sales x 2004 prices, differences in Gs., difference in %.



Comparison of current income with Line base at Calle Bertoni, by producer in Guaranìes. Qty. sales x 2004 prices, Qty. sales x 2006 prices, in Gs./ year.



Comparison of current income with Line base at J.M. Frutos, by producer in Guaranìes. Qty. sales x 2004 prices, Qty. sales x 2006 prices, in Gs./ year.

The annual income values by sales of honey in JM Frutos practically duplicate those from Calle Bertoni, averaging 5.036.600 guaraníes and 1.762.500 guaraníes respectively, in 2006, compared with 3.098.400 and 600,000 guaraníes in 2004.

The larger honey producers of JM Frutos obtained an income from beekeeping of about 9 million guaraníes / year, whereas those of Calle Bertoni reached about half that amount, with 3.6 million guaraníes / year.

1.3 Evaluation Methodology

1.3.1 General Design / focus

According to JICA's procedures handbook, the evaluation of projects has three stages: 1) valuation of the project's results, 2) judgment of value based on the Five Evaluation Criteria, and 3) elaboration of recommendations, attention to lessons learned and the feedback.

The evaluation was designed on the basis of approaches with secondary information and surveying of primary information. Evaluation structure was set around valuation judgments based on parameters of relevance (to verify, the need to implement this project), effectiveness (to verify, the expected result), efficiency (to verify, the costs of investment if it was adequate or not), impact (to verify, the superior objective of the project and the result of expansion) and sustainability (although this project has not ended, it would be able to be anticipated the persistence of the project).

As superior criteria of framework it has been taken into account the criteria for Human Security that within the framework constitutes the guide of the Japan cooperation at the Official Development Assistance (ODA)

The study was made taken as it bases these existing data: Agreement Minutes and the Logic Framework, signed between MAG and JICA on March 30, 2005.

As far as the primary information, it was gathered by means of personal interviews to: direct technicians counterparts from (DIPA), technicians at local bases

(extensionists from DEAG) and to honey producer members of each Committee (objective population) and to nonmembers as controls. It is intended to try to identify cause-effects relations of the project.

1.3.2 Sources of data

The field evaluation was made by means of consultants visits to the committees attended by the project, in which there were interviewed individually and separately, the committee members (objective group) and at least a neighboring nonmember beekeeper (without project), as control, besides to interviewing the local base technician (the extensionist from MAG). When it was possible it was diversified the interview frame to include also young producers and women (Gender).

Two types of questionnaires were designed, one for technicians and the other for the honey producers. The evaluation questions were organized on the basis of the five evaluation criteria. The questionnaires included both closed and open questions, looking for qualitative and quantitative information

1.3.3 Instruments

As main instruments of evaluation it was designed two questionnaires, one for interviewing the counterparts' technicians, and another one to survey the associated, or not, honey producers of each committee. In the preparation of questionnaires the follow up information of the project was considered in addition to the contents from the displayed technical proposal. In Annex Nº 1 copies of the used questionnaires are enclosed.

In addition, both secondary and direct information was relieved related to the market variables of honey and their derivatives in Paraguay, as well as the trade balance. Also, it was tried to elaborate the flow chart of the production chain of bee honey and its derivatives.

For the questionnaires elaboration in addition to the five criteria for evaluation, the information from the project's follow up written up by Nelson Matsuo expert was considered and also the Agreements Minutes.

With the approaches and instruments results, a Table of Evaluation according to JICA's lines was elaborated. In addition, a Table of Evaluation Results Summary was prepared

1.3.4 Evaluation team

The evaluation team was integrated by Ricardo Pedretti (coordinator) and Angel Ruiz (specialist in monitoring and evaluation) who performed most of the field visits and interviews to counterpart technicians from DIPA and DEAG. In addition, Mariana Oeyen (researcher) also had the responsibility of compilation of secondary and direct information relative to the production and internal / external marketing of honey and its derivatives, participating in the field visit in the locality of Atyrá. The analysis and writing of the evaluation report were made altogether by the consultants of the Project

2. – Project Justification

There are several indicators that could evaluate the relevance of the project in the general context in which it has been implemented. For the design of this evaluation some indicators have been chosen that would denote this relevance from the point of view of the following actors: i) the honey producing beneficiaries, ii) the consumers demanding beekeeping honey and derivatives products, and iii) the government which impels development policies.

In other words, the project would justify if it adjusts, in a minor or greater degree, to the following conditions: i) that the project has been a response to the demands from the producers, ii) that the components of the project adjust to the necessities of these producers, iii) that it has been appraised a tangible demand of the consumers by a greater variety and quality of beekeeping products and iv) that exist policies, and governmental programs or other projects to stimulate and to improve the beekeeping production in Paraguay.

2.1 The project as response to the demand of its beneficiaries.

In this section of the evaluation it has been analyzed if the project has been supplied without adjusting to real demands of the producers or constitutes an answer to expectations generated from the potential beneficiaries. For this there have been analyzed indicators related a: i) demands for diversification alternatives, ii) previous experience of the producers in beekeeping, iii) existence of marketing channels and iv) voluntary entailment of producers.

The implemented project does respond to a concrete demand of the universe of beneficiaries. 60 % of the producers interviewed had seek at least to some instance in search of technical support for the beekeeping production

The beneficiaries organized in beekeepers committees previously have been contacted by other projects or agents from DEAG. In the case of Sapukai he was mentioned that they counted previously on some training received form the SNPP. In Calle Bertoni and Atyrá, the committees were benefited with donations of equipment and inputs as well as their own local were built by the Proyecto Inversiones Rurales Comunitarias (IRC-MAG/BIRF). In these entire cases the main complaint coincided that the main failure consisted in the insufficient technical qualification received as training.

During the interviews to the producing beneficiaries it has been stated that they consider the beekeeping activity as very important. In half of the cases the productive alternative offered by this project has represented an option of diversification to the producers. In the other half of the informants the beekeeping has served to replace nonprofitable alternatives.

In Sapukai, the strong environmental limitations (poor soils, stones) determine high percentage of native vegetation, becoming the beekeeping production a profitable activity with high quality without displacing other productive activities. In Atyrá, most of the committee members were suburban inhabitants dedicated to out of farm activities (sale of wage-earning work) lacking many of them their own land, where the beekeeping activity represents an additional income. In Calle Bertoni, although all were farmers, many declared to drop the culture of cotton by increasing production costs and exaggerated use of agrichemicals. The beekeeping production represents to them a substitute alternative of income,

mentioning some of them their interest in sesame production by its double purpose, grains as well as differentiated honey. In Juan Manuel Frutos, the majority are urban dwellers that produce honey at own, rented or lent parcels, that in some cases have left urban wage-earning activities to dedicate themselves fully to the commercial production of honey.

More than 75% of the interviewed producers had some previous experience in beekeeping production. Nevertheless, not all these producers took before the beekeeping as an activity for rent. Close to a third of the interviewed people did not commercialize beehive products before the implementation of this Project

In the first mentioned case, most of the honey production was used for family consumption or for their relatives, not getting to commercialize them at the beginning of the project. At the present moment the conscience of its commercial destiny as a profitable activity is an achievement got by the Project.

The marketing channels were not completely formed at the time of this evaluation. A great majority of the interviewed people who commercialized bee honey and derivatives did it locally (8 out of 14). Quite few of them sent their bee products (mainly honey) to distant centers of consumption like Asuncion or Eastern City. Other 5 producers not even got to produce yet, whereas in a single case he produced just for his own consumption.

Significant changes in the observed patterns of commercialization have not been detected before the implementation of the project. Many of the interviewed people had not yet harvested for the first time, lacking enough amount of products to commercialize them, from the beginning of the implementation of the program. Others that previously did not sell honey before began to do it at local level. Producers that habitually sent their production to Asuncion and Ciudad del Este, maintain those commercial bonds.

The marketing aspect represents several stages of development: Those that at the moment continue producing for self-sufficiency are generally the controls, who are neighboring beekeeping producer's non committee members. At first instance after joining the Project, the sales are of low scale and exists local unsatisfied demand, not justifying out of town sales. Those who commercialize in remote locations belong to the most advanced committees (Calle Bertoni and JM Frutos).

The interviewed honey producers have identified numerous sources of information about the program, which have motivated his entailment to it. This fact suggests that entailment has been voluntary, perhaps motivated by the demand for diversification or that the previous experience in this activity that has already been mentioned. The voluntary entailment of the producers also has been emphasized by all the interviewed technicians.

2,2 Degree of adjustment of the Project components to the producers needs.

The degree of adaptation of the program components to the producers needs has been evaluated according to the following criteria: i) the satisfaction of honey producers with the new acquired techniques, ii) the frequency of use of the gathering and storing center, and iii) the inputs and equipment availability.

It is assumed that the degree of the producers' satisfaction is tied with the utility that they perceive on learned techniques through the assistance components of the project. On the other hand, a scarce use of the gathering and storing centers would imply that this component has little relevance between the producers (or vice versa). Finally, the difficulty or facility of access to the required production inputs and equipment can provide indications on the utility of the program components, since obstacle access to these inputs and equipment can jeopardize the development of the productive activities, making the project irrelevant.

The points mentioned in the previous paragraphs have been explored in the interviews realized to 20 producers benefited by this project. The totality of the interviewed people has agreed when declaring that they have acquired new techniques through the components of the project. Moreover, all of them showed satisfaction in reference to the relevancy of techniques learned during the advising offered by this Project

All declared to have radically modified the handling of beehives as a result of the project (handling of young bees, winter feeding, printed wax production, swarm avoidance, use of rises, harvest time, etc.). In addition, they reported improvement in the manufacture of beehives, adopting the double drawers with rises, which they did not know previously.

The relevance of the gathering and storing center as component of the project has been explored based on the frequency of its use. Nevertheless, we have not been able to measure this indicator because: i) all committees of visited producers do not counted yet with storing centers (Atyrá), ii) one of the storing centers still was in construction (Sapukai), and iii) the producers had not yet harvested their first production and therefore they could not use still this infrastructure. Consequently, it is not possible up to now to evaluate how needed is this project component for the producing beneficiaries.

In the more advanced committees at Calle Bertoni and Juan Manuel Frutos the gathering and storing centers have been used for the first time with satisfactory results, obtaining high quality honey.

The new techniques widespread by the project would be irrelevant for the producers if these require inputs and special equipment difficult to get. Nevertheless, during the interviews maintained with the producers have been identified only two required inputs (printed wax and sugar), which in most cases are available in the towns near their communities. However, some producers have declared to acquire these inputs from Asuncion or obtained them by means of donations.

One of the new capacities emphasized by the more advanced beekeepers consists in that they learned to make their own printed wax. Nevertheless, the increase in the number of beehives implies that they still are not self-sufficient, having to buy the necessary excess.

The required ware and equipment are a little more difficult to accede. Nine of the twenty interviewed people have acceded to the equipment through donations of this or other projects, another four interviewed people have acquire them from the Capital city, five producers bought the equipment in near locations and two of them have managed to have them by artisan "making" of their own equipment

In general, they have learned to artisan making beehives with rises made of local wood frames with stainless steel wires (according to regulation of Mercosur). (See photos in Annex). In the case of personal equipment (veil, gloves, garments, smokers), it was mentioned that they are those that require frequent replacement of spare part due to fast wearing down, being normally acquired with their own resources

2,3 Tendency of consumers demand for by products derived from beehiving activity.

In this aspect the relevance of this project has been investigated from the point of view of the "market". The production of production items without demand would cause as much that the project loses relevance, both for producers as for consumers. During the evaluation we have concentrated on indicators that could illustrate the consumption trends of bee honey (and its derivatives) at both national and regional level. For this purpose surveys have been realized at wholesale supermarkets in Asuncion, and secondary information on supply and demand have been collected.

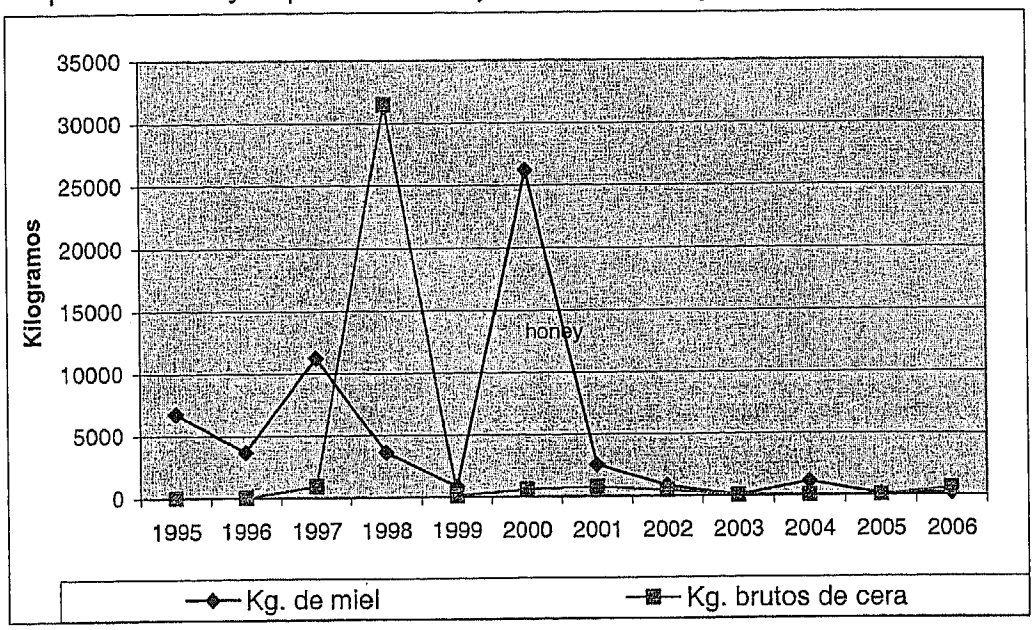
The internal market is underdeveloped, mainly for fundamental reasons where in first place lies in the generalized ignorance of properties from these products and their derivatives. Although in Paraguay honey consumption is directly bound to certain *traditional desserts and medicinal cures*1, it is estimated that the same one is between 100 and 120 grams2 by person per year, levels much below the registered averages in the main consuming countries and also of the world-wide average. This should be due to the strong competition from sugar and to the ignorance of product quality that are offered in supermarkets. Nevertheless this trend tends to revert because of consumption increase and the dissemination of information about natural products with good properties for health.

In Paraguay, a high proportion of small honey producers operates in the informal market and supplies consumers in direct form, fundamentally on the basis of personal relationships and to negotiated prices every time, that usually favor the producer. This informality finds its sustenance in the organization of beekeeping in Paraguay that represents much like a complementary activity for both small producers as for small urban settlers across the countryside, which mainly finds in honey production and not as much in other derivatives an alternative for the income increase or a consumption complement. This type of production implies a series of characteristics that influence in the production capacities and development of beekeepers like lack of information, nonprofessional manipulation, low production levels, low capacity of negotiation with suppliers and buyers, characteristics that show the high degree of informality of this sector, situation that makes difficult its recording up in statistics.

In spite of the scarce available information some indicators have allowed us to assume the increases of production and national consumption. Under the assumption according to which the national consumption has stayed stable or even increased in the last 10 years it is possible to be inferred that the national production has gained market. This is based in comparison of national production levels, considered by the Beekeepers Association of Paraguay (ASAP) estimated in approximately 800 tons annually and per capita consumption, previously mentioned. It is assumed that almost the totality of national production is in

practice destined to the national market. Our previous supposition is confirmed because the sustained reduction of honey imports as well as of printed wax on a yearly basis (see Graphics 1), although highly fluctuating since 1995, is added to their clear presence of national products in almost 100% of markets shelves. Another indicator susceptible to be considered is the existence of a buyer's directory of honey of the Market Management Department from the Direction of Commercialization, Ministry of Agriculture and Livestock, that already has 11 new recruits.

Graphic 1: Yearly imports of honey and wax in Kg.



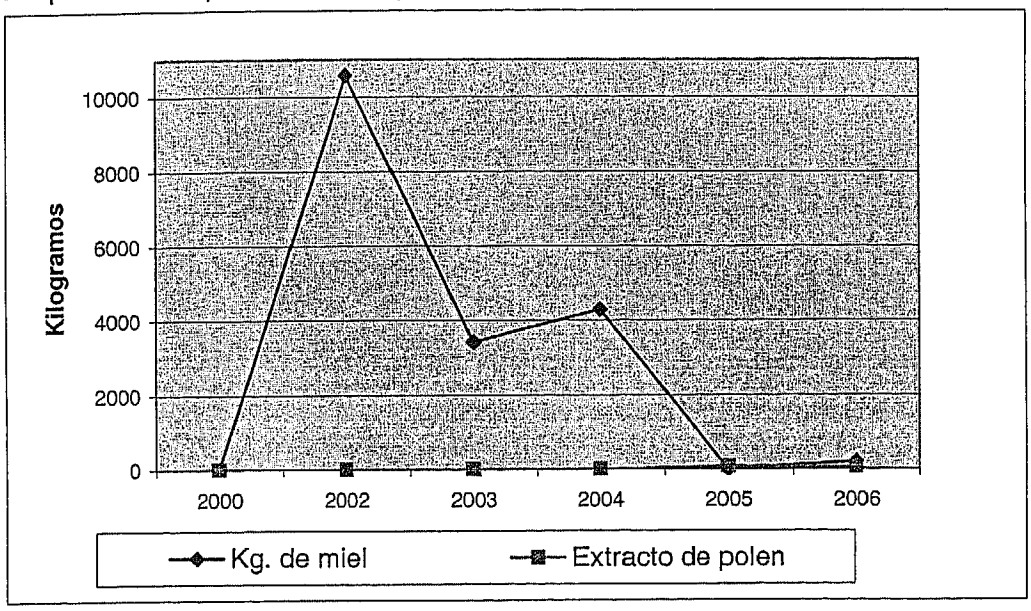
Fuente: Datos proveídos por la Gerencia de Estudios económicos del Banco Central, febrero 2007.
Source: Data provided by the Economic Studies Management Office of the Paraguayan Central Bank, February 2007.

At world-wide level bee honey consumption is destined mainly to three great items: i) for direct consumption, ii) through industrialized products (such as natural sweeteners, dairy and derivatives, cereals, candies and breads, among others), iii) in cosmetics, pharmaceutical and naturist products.

In the case of Paraguay, it is estimated that honey production in its almost totality is related to direct consumption. In respect to this subject, the President of ASAP suggested that given the quality of the national honey, that the present moment is key to stimulate the exports, the production of derivatives, and the need to make an information campaign on this product goodness. On the same topic, the manager of one important supermarket branches in the Asuncion metropolitan region explained that since now it does exists a labeling law and that the presentation of the end product has become more hygienic they have chosen to offer on shelves only national products in a 100%. It is also considered the importance of promoting the goodness of the product and considering that the amount of product supplied has arrived at the top in for direct consumption, at least for this chain of supermarkets, nevertheless they exploring the possibility of incorporating honey in the elaboration of some bakery product, which would amplify the market increasing the consumption levels. Out of the beekeeping derivatives few of them from national production are on shelves or at specialized warehouses, leaving this important market part to producers of foreign origin.

This production increase has brought with it an increase in the demand for inputs and has given origin to the creation of micro enterprises as suppliers of beehives, printed wax, universal handles, clamps, trap for pollen, protection garments, smokers, extractors, filters, decanters and isoperculators, developing everything a new endeavor. Thus it can also be observed the first exports of honey as much as of extracted pollen since the 2000 year, noticing highly variable values getting to register 10,586 kg in 2002, being an important year at the international market level.[1]

Graphics 2: Exports of honey extract de pollen in Kg.



Fuente: Datos proveídos por la Gerencia de Estudios económicos del Banco Central, febrero 2007.

Source: Data provided by the Economic Studies Management Office of the Paraguayan Central Bank, February 2007.

At world-wide level, the consumption displays an increasing trend due to the larger demand in some traditional markets and to the incorporation of new ones. The changes of nourishing habits in the population, privileging a healthier and more natural feeding, contribute to increase the expectations on the demand growth as much internal as international. The increasing demand of honeys of monofloral type (alfalfa, trefoil, eucalyptus, citrus, Cathay, among others) and differentiated, as well as from derivatives products appears as a clear opportunity given the excellent conditions for production of the same ones in Paraguay (as much for honeys monofloral, as differentiated and derived, like green propolis as an example).[2]

The import behavior of the main buying countries does not keep a well defined trend; this is given by the facility of conservation of honey, which facilitates the stock handling and the regulation of purchases. Consumption at world-wide level

[1] Year when the main world suppliers, China y Argentina, have been affected by contamination problems, leading to several markets closures.

[2] Ministerio de Economía y Producción, SAGPYA,, Argentina, Beekeeping Report, Síntesis Apícola, January 2006, Nº 105

displays an increasing tendency due to the higher demand in some traditional markets and the incorporation of new importing countries like Lebanon, Arabia, Oman, Syria, etc. It is estimated that the consumption average at world-wide is in the 220 gr. by inhabitant per year level.[3]

An important number of countries are identified that report imports of honey, although just 10 countries absorb practically 90% of the world-wide sales. The global purchases of honey have been led by Germany, the United States and Japan in the last years.

The demand of Germany is rising since this country buys in bulk, industrializes the product, mixes it and then packages for again re-exporting, having Europe as main destiny by the proximity and taking advantage of the common market. The suppliers of Germany are around 70 exporting countries and the concentration of the purchases is not very high, having Argentina like their main supplier of bulk honey. United States mainly concentrated their acquisitions in 4 countries in spite of counting on around 50 suppliers. The present tendency to the market deconcentration appears favoring emergent countries which have provided greater competitiveness in the market. The expansion of Japanese imports has been constant across time, having China like the main supplier for reasons of lower prices and geographic proximity.

In relation to the producing countries, China historically has been the main world-wide producer of honey and the first exporter. It is followed by Argentina and Mexico. The Chinese honey has been always very competitive in terms of price in spite of the costs by additional analyses that are made to it in the European Union (UE). This advantage on prices has been sufficient to allow a reactivation of the exports to the European Union. It is possible to remark that after 2001 for the first time cloranfenicol was found in the honey, which has affected the volumes of honey exported from this country.

It is considered that in general the two last years have been beneficial for the production of honey in Latin America and the Caribbean; predicting an increase in the volume of export as well as in the internal consumptions. A factor to be considered is the price of sugar. The world-wide increase of the latter together with the greater international demand has managed to maintain the prices of honey relatively high in the different world-wide markets.[4]

At regional level, the producing countries are Argentina, Brazil and Chile, the latter recently incorporated to the market. Argentina[5] has closed the 2005 year registering an historical record surpassing the 100,000 exported tons of honey. The totality of the beekeeping sector provided to the country a currency income by a total near the 130 million dollars of which 124 million corresponded to honey. Brazil, nevertheless, during the 2006 year has been outside the European market

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[3] www.apicultura.com,· www.agrobit.com.

[4] Ministerio de Agricultura de Chile, ODEPA, Balance del Chile Apícola 2006: ¿y cómo viene la nueva temporada?, Santiago, Diciembre 2006.

[5] Ministerio de Economía y Producción, SAGPYA, Informe Apícola, Síntesis Apícola, enero 2009, Nº 105

after receiving a visit of inspection of the European Union. The same one decided to close the entrance of honey from Brazil until they do perfect the system of certification of exports. In spite of this situation Brazil has concentrated its shipments to the United States and other destinies.

Chile has shown an increase maintained in volume and value of exports. In the last ten years It can be appreciated an average higher value and volume in relation to the complete period between 1986 and 2006. The rate of annual growth is 9% for the exported volumes and 12% for the values.[6]
So that the project reaches relevance, at least a tendency of stability in the demand of these products should be detected, without supply expansion. A stabilized demand with increasing supply or a decreasing demand both remove relevance to the project unless it is oriented to the production of differentiated items like the green propolis.

As it is possible to be appreciated, in general the consumption levels are rising, as much by a diversified demand for the monofloral or differentiated honeys, as by the increase of consumption of new products. This presents a great opportunity for all this sector of Paraguayan production, which needs, according to the international demand, to increase the levels of yield, controls and quality standards to obtain more significant market quotas.

So that the project reaches relevance, at least a tendency of stability in the demand of these products should be detected, without supply expansion. A stabilized demand with increasing supply or a decreasing demand both remove relevance to the project unless it is oriented to the production of differentiated items like the green propolis.

2,4 Relevance of the project for public policies.

A project that does not articulate itself with other strategies of public policies not only loses relevance for the government, but also has risks of being unsustainable. In this section the existing governmental policies for the support of beekeeping sector in Paraguay have been investigated. Not only inorganic indicators like documented strategies have been investigated, but also organic indicators like the budget and assigned personnel.

To the effects of establishing an evaluation rank, this consultancy tries to determine the relevance of the project for public policies according to the degree of fulfillment of the following conditions: i) existence of other strategies for the development of production or beekeeping activity, ii) that a real budget sufficient to articulate other interventions are counted on, iii) that exist specialized human resources, and iv) that exists numerous users of support services granted by the public sector.

The MAG incorporates the beekeeping projects in different programs that count habitually on external cooperation, such as the case of Communitarian Rural

[6] Ministerio de Agricultura de Chile, ODEPA, Balance del Chile Apícola 2006: ¿y cómo viene la nueva temporada?, Santiago, Diciembre 2006.

Investments (MAG/BIRF, Social Investment funds), in parallel to the routine projects as programs through the Direction of Agrarian Extension form MAG.

In addition, other public institutions such as the INDERT (Agrarian Reformation and Rural Development) have a component of beekeeping within their program of diversification of production in the new settlements. Also, in the case of the Secretariat of Social Action another project exists of social investment funded by the World Bank financing, in which exist projects of beekeeping at producers committees at below the line of poverty level, in the Departments of Ñeembucú, Itapúa and Misiones. The DIPA/MAG cooperates with all of them under the form of interinstitutional agreements in the capacity building role.

The realized budget does not respond to the planned one exactly since the resources allocation corresponds to the Direccion (DIPA) without discriminating between internal Departments, not having therefore a fixed predetermined allocation. The technicians declare the insufficiency of financial resources for the assumed commitments, constituting a limiting factor for future program expansions. The beekeeping laboratory of DIPA routinely makes physical, chemical and biological analysis that determines the quality of the product without including residuals. These last ones are analyzed in SENACSA .

In addition to DIPA, the National Service of Health and Animal Quality (SENACSA) counts with laboratories of pathology and quality (analysis of residuals), being the institution in charge to qualify and to certify the Centers of Gathering and Storing built by the project.

Specialized human resources exist, but it can be that scarce renovation happened during the last years. If this project does not contemplate the qualification of human resources (fresh) in the public sector, its relevance for the public policies is going to be limited. As far as human resources, it was declared that the last technicians incorporated have been two (one in Pathology and another one in Production) in the last couple of years. At the moment the Department of Beekeeping has seven technicians specialized in diverse areas, answering therefore the questionnaire. According to the quest, as far as the number of users of the DIPA Laboratory is concerned it dos exist about 40 users, discriminated between both physical persons and corporate entities, including supermarket chains. All the analyses of quality are intended to the internal market.

Finally, in the country it has been identified 7,500 beekeepers out of which 1,200 are registered in the Department of Beekeeping. This registry is established in the Law Nº 665/1977.

In this frame the relevance of the present project is verified from the public sector interest point of view.

There exist numerous producers interested in the governmental interventions on beekeeping. According to the ASAP registries, Paraguay has about 5500 beekeepers. The technological level of the Paraguayan beekeepers is underdeveloped, being a proof of this the scarce demand for laboratory services provided by MAG, situation that has forced the realignment of the project.

Factors that contribute or make difficult the relevance of the Project

Among the factors that contributed to the relevance of the project are emphasized:

- i) There exists unsatisfied demands of beekeeper producers to improve the commercial production of honey and the diversified products, that was reflected in the active interest of the groups of attended producers, resulting in the high valuation and collaboration in the performed activities,

- ii) the previous experience of producers assured the beneficiaries motivation from the beginning, avoiding the risk of attending pretended producers that they only wait for immediate economic benefits of projects with external assistance,

- iii) the beekeeping production specialty turned out to be very interesting to the producers like source of monetary income, passing from an artisan production to a commercial one, being inserted first in small sales to relatives, friends and in the local community, until sales in greater scale in remoter markets later.

- iv) the Project was better implemented when the counterpart technicians were formerly beekeepers themselves, in contrast to the attended ones by local base technicians with a more generalist formation,

- v) The project components considered training on modern beekeeping technology anticipating donations of inputs and equipment only when it was necessary, removing therefore a frequent obstacle by which initial results are not obtained given the poverty of the beneficiaries, that usually prevents them to acquire the minimum means and at opportune time to adopt the recommended technologies,

- vi) the existing unsatisfied demand for honey from the local to the national level, has stimulated the production marketing with very good prices, serving this as an incentive to the producers

- vii) at the level of governmental programs for supporting beekeeping there are installed capacities in DIPA and DEAG, with qualified and motivated personnel available for several decades, in addition to a previous project for the beekeeping laboratory strengthening at MAG-DIPA located within the Faculty of Agrarian Sciences of UNA. They accompanied the JICA expert in his training tours as counterparts.

Among the factors that made difficult the relevance is mentioned:

- i) the assistance demand of the producers was quite basic, requiring that in this stage to consolidate them first as producers of honey with productivity and quality, before being diversified in more sophisticated production lines, representing this a change of the project approach,

- ii) the slight antiquity in producers previous experience (case Atyrá and Sapukai) in beekeeping resulted in a slower advance of the project,

- iii) although capacities in the public sector exists for supporting the beekeeping production, the operations and budgetary difficulties affect permanently their capacity of intervention, and numerous beekeepers

communities of the interior do not accede to the scarce cover of these programs

- iv) in other cases, there are programs of beekeeping support financed by Projects in development loans agreements, which once finalized frequently did not manage to be sustainable by diverse reasons, which generated a certain lack of credibility at the beginning of this project

3. - Effectiveness of the project.

With the evaluation of the effectiveness of the project it is pretended to determine to what extent the developed activities have contributed to reach the goals and results proposed in the original design. It is possible to remember that the superior goal of the project is "to improve the standard of life of beekeepers through the establishment of production of high quality beekeeping products".

The stated specific objectives in the Project Design Matrix are: i) establish conditions to improve the quality and to diversify the beekeeping production, and ii) transfer technical knowledge among the beekeepers for beekeeping product diversification.

The project tries to reach three concrete results for the fulfillment of its objectives and superior goal. The expected results are: i) adoption of suitable production techniques on the part of the producers, ii) minimum infrastructure installation for gathering and storing centers, and iii) the laboratory of Ministry of agriculture is fortified. Next the results found during the analysis of the diverse considered indicators are presented.

3,1 Project results with respect to the objective of increasing producer's income

The evolution of the producers' economic well-being levels has been analyzed through their gross income, as well as by capitalization of the producers during the last years. In order to determine the producers' capitalization it has been investigated during the interviews about the acquisition of goods or recent infrastructure improvements. Also it has been investigated the recent evolution of expenses, assuming that the higher expenses derive from higher income.

Around 60% of the interviewed people perceive that their income have increased since the project began. A great majority of these producers attributes this apparent increase in income to the beekeeping activity that they are performing. The rest 40% of the interviewed people were in levels of incipient productive consolidation, without commercializing yet their products, thus they did not perceive significant variations in their levels of income.

The beekeepers who still did not perceive income yet belonged mainly to committees with lower development level (Atyrá and Sapukai), which with few beehives and at initial stages of capacity building rather produced for self-sufficiency and distribution to relatives. In the more developed and older Committees (Calle Bertoni and JM Frutos) the production was clearly in larger scale and with commercial goal.

Most of the producers that declared to have improved their income also reported to have increased their assets recently. In several opportunities the investments

done had productive purposes like: i) to increase the beekeeping production, ii) to increase cropping areas, iii) to increase land surface, iv) communitarian investments (in the committees) and v) even to invest in education.

In initial stages, the beekeepers reported to invest in purchases of inputs and new beehives as a higher priority.

The reliability of the well-being indicators has been verified through control questions, finding a high relation between the producers that declared to have increased their income and those that have responded that increased their expenses. On the other hand, most of the beekeepers who declared not to perceive substantial changes in their income do not perceive greater expenses either.

The higher income generated as a result of the implementation of this project seem enough to be valued by the producers; but not sufficiently significant for producing substantial changes in the producers standards of life. The producers that increased their income used these "excesses" to invest in smaller equipment, contributions for communitarian investments, school, health, clothes, etc. There have been few cases of producers that declared to have done more important investments like preparation and improvement of their houses or infrastructure (only 10 % of the interviewed people).

In the most advanced Committees, the money perceived by honey sales was destined mainly to family expenses, not reaching the perceived amount for more expensive investments like those for the houses.

It is possible to emphasize that the real and effective implementation horizon of this project is not yet very long. The profits reached in the matter of income of their producers are very interesting as well as the projections of this indicator at short and medium term.

3,2 Effectiveness of the project in the diversification of supply of beekeeping products.

In order to determine if the project has been effective in productive diversification it has been investigated the evolution in the variety of commercialized products and the weighting of the importance of these items in the total income from beekeeping production. The simple product supply variety does not guarantee the improvement of the standard of life for the beekeepers unless each diversified item receives a significant economic importance. The economic importance of each product basically depends on the variables of volume and income; by such reason the evolution of these variables has also been consulted.

The analysis of the interviews made suggests the degree of diversification in the beekeepers is still quite limited. Only 30% of the interviewed people produce more than one beekeeping product, whereas the other producers concentrate themselves exclusively in the production of bee honey. The products of beekeeping diversification found during the interviews were not varied, being reduced to wax, propolis and, (in one case), prepared medicinal.

It was previously mentioned that the honey production system was very primitive not knowing the production technology that assures high productivity per beehive.

The higher productivity led to the most advanced producers to increase the number of beehives with which the printed wax production technique was used for self-sufficiency in most part, although in numerous cases it was mentioned that it was not sufficient for the expansion needing to buy additional wax.

The scarce diversification of Beekeeping products has not been translated in a real diversification of income sources. Most of the producers sustain their beekeeping income through the commercialization of bee honey. The ranks of commercialized volumes are between 25 and 180 liters at prices which vary among 15,000 G$ and G$ 20,000 per liter (1 liter of honey is equivalent to about 1.4 kg). The beekeepers that produce wax tend to use this product as a productive input. The commercialization of propolis has not contributed to in more than 5% of the beekeepers income of who sell this product.

A significant increase of beekeeping products prices has not been appraised that can have contributed to the income increase of beekeepers. Most of the interviewed people who are commercializing regularly said that the prices have stayed stable. Other producers have perceived a slight improvement in prices, possibly by better conditions of treatment or improvement in the quality of their products.

On the other hand, most of the producers that commercialize their products could increase their income by an increase in production. Nevertheless, this increase has occurred mainly by the production of honey. Consequently, it is possible to be inferred that the income have not been increased by beekeeping diversification; at least within the present horizon of this project implementation.

3,3 Effectiveness of the project in the adoption of new productive techniques.

In order to determine the effectiveness of the project in the adoption of new productive techniques it has been consulted to the producers which techniques have incorporated from the beginning of the project implementation. Also it has been consulted the perception of these producers on the effect of "the new" techniques on quality and diversification of production, as well as the impact on the production volume.

The consulted beekeepers have named diverse techniques learned as a result of the assistance provided by the project. The most frequently mentioned techniques were: *decanting, control of beehives, maintenance of drawers, change of honeycomb, cleaning, changing rises, rotation of honeycombs, shelters for beehives, frames position in the honeycomb, spacing in the rearing camera so that the queen puts eggs, monitoring to the queen, royal jelly production, treatment of diseases, handling of queen, how to avoid swarming, increase of young bees with new waxes, artificial feeding in the winter and first steps for propolis production.* The amount of the mentioned techniques suggests the project has been effective enough for diffusion and adoption of new practices.

The new practices learned also led to changes in drawers construction for beehives adopting the double boxes with rises, learning how to construct them by themselves lowering their cost that reaches 120,000 guaraníes each one if they are acquired externally

Practically all interviewed people agreed in the perception by which all acquired techniques have been useful for improving production quality and volume. The consideration on the proportion of operculated cells for harvesting has been a frequently mentioned technique with great impact on the quality of production. Another factor of great incidence on quality was the equipment used, as well as the installed centers of gathering and storing. Some producers have mentioned that the use of centrifuges sensibly increased the quality of their products.

The producers declared not knowing previously the importance of the recommended practices for honey harvesting to achieve high quality products.

The techniques that contributed to the increase of production quality have been more easily identifiable by the producers than those techniques that contribute to increase their volume. Many of the previously mentioned practices could have contributed to the increase of the production volume (identified by the same producers), but the beekeepers did not know or identify the specific reasons of the production increase. This fact can bring consequences for the sustainability of these practices, mainly if they imply significant expenses for the producers

That previous fact occurred in the less developed communities that still waited for their first harvest at the time of the present evaluation.

The extended techniques have not been very effective for the diversification of beekeeping production. About 60 % of the interviewed beekeepers shared this opinion during the field work of this consultancy. Nevertheless, this perception is not definitive since another 40% considered that these techniques were effective to diversify production.

Among these last ones are the most advanced producers, from the committees of San Pedro and Caaguazú.

The identified practices in the previous paragraphs in this section include the propolis production and royal jelly. Nevertheless, in section 3.2 have been stated a modest diversification of production and neither a high association (in the perception of the producers) between the technical assistance and the possible amplification of the variety of beekeeping products is not appraised for commercial purpose.

The Project had to be concentrated in improving the beekeeping production in a first stage before trying to promote more sophisticated productive lines. In JM Frutos, it was tried to produce green propolis but soon it was identified the effects of some plants different from Chirca that produced propolis with darker coloration, problem than must be solved.

3.4 Operative state of the gathering and storing centers.

In this phase it has not only been verified the effective installation of the gathering and storing centers, but its operation and functionality for the beneficiaries beekeepers. For this purpose it has been consulted to the producers what fraction of their production they sent to the gathering and storing centers and if they have knowledge of the normative for using these centers. Also, it has been consulted to the people in charge of the storing centers about the evolution of the volume of processed products, and it was tried to verify that with accountable registries.

Not all the centers of gathering and storing were installed at the time of this evaluation. In fact, less than 50 % of the producers interviewed had the option to send their production to storing centers. The others still did not count on this type of infrastructure.

The already built Centers of Gathering and Storing and in operation are those from Calle Bertoni and JMFrutos, being next to finalize the one at Sapukai and next to be built the one at Atyrá. In the Chaco area it is still to be defined the final location given to the shortage and dispersion of the small producers targets of the Project.

Most of the interviewed people from Bertoni and JM Frutos were surprised by the high quality of the constructions and equipment invested by the Project (see photos in Annex). The majority of them demonstrated to know the strict regulations and expressed zeal for their infrastructure, being conscious of the quality of their beekeeping products as a result of these project's investments. In the other communities, the gathering and storing center still were under construction, and the already built ones by other previous projects were rather inadequate or they did not responded to the MERCOSUR norms.

Among the producers with access to the centers of gathering and storing installed by the project, an important fraction had not yet made use of this infrastructure given they did not counted with enough harvested products. Between the beekeepers who are using this infrastructure, the proportion of products sent to the market varies between 30% and 100% of the total processed volume. The products are sent with a weekly to biweekly frequency during the harvest time.

A great majority of beekeepers, who have access to storing facilities, know the regulations that each committee has elaborated for using this infrastructure. When asking the specific identification of some of these use rules, the beekeepers most frequently remembered the norms relative to the hygiene in the facilities' use.

There are not yet sufficient elements counted on to evaluate the project effectiveness in the operability of the gathering and storing centers. Their installation is still recent (possibly slowed by efficiency problems that will be discussed later) and it is not possible to appraise if such component will be functional to the producers in the medium term. It is recommendable to review this indicator in more advanced phases in the implementation of the project.

3,5 Evolution of the service quality of the beekeeping laboratory from DIPA.

The DIPA Laboratory at San Lorenzo is well equipped but, according to the expert, lacking equipment such as CO2 Kuderna Danish stove and Laminar Flow Chamber. Also, that the equipment is at the moment in operation although appearing as a problem the low number of monthly analyzed samples. Another mentioned difficulty is that sometimes there are not available all the required inputs to perform the analysis.

Currently, analysis of samples are monthly performed originating from about 40 wholesale merchants from the central zone as well as commercial larger scale entrepreneurs (large scale individual producers, commercial companies, supermarkets, and even small scale honey exporters).

On the other hand, analyses of honey samples and other derivatives produced within the framework of the project were not made yet.

Factors that contributed or difficulted the effectiveness of the project

Between the factors that contributed to the effectiveness of the project it is mentioned:

- When completing a productive cycle of the project, the beekeepers have been able to experience the improvement of quality and productivity constituting this in an incentive for the increase of production scale
- ii) To have a local base technician with knowledge and personal experience in beekeeping, that allowed better follow up.
- iii) To count with support from specialized technicians from DIPA to the local expert, cooperating in knowledge, experience and with capacity to surpass idiomatic barriers.
- iv) the high quality of facilities from the Center of Gathering and Storing and its equipment, conferring high credibility to the Project.

Between the factors that made difficult the effectiveness of the project stands out: (among noncontrolable external factors by the project):

- the low level of producers expectation at the beginning, until verifying that really they have learned new techniques and that the activity was promising, taking several months in reaching this level of perception,
- ii) the initial mentality of considering beekeeping as a secondary production complementary to other activities,
- iii) low initial credibility given the experience with other previous projects by operative difficulties that jeopardized the fulfillment of goals, specially in the deficient and just theoretical qualification assistance in most of the cases, and

(controllable factor by the project):

- iv) the time passed in DEAG to designate the local technicians of base in some locations, additionally resulting in its qualification in a more delayed date than the planned one.

4. - Efficiency of the project.

In order to measure the efficiency of the project three groups of indicators have been considered. The first group contains a single indicator that relates the total cost of the project to the total value of the obtained production by means of its implementation. The second group of indicators evaluates the implementation of the project since its planning and the allocation of resources. The third group of indicators looks for to compile information on aspects non predicted previously that can contribute (or restrict) the efficiency of the project.

4,1 Cost efficiency of the project.

The global budget of the project within the two years horizon of implementation is of 21 million Yens. At the exchange rate average, this amount would represent USS 182,600 (If the investments destined to construct and equip the Centers of Gathering and Storing are included, the total amount ascends to 325,000 USD). The financial resources were intended to be destined to the following components: i) third country expert , ii) training courses within the country, iii) provision of necessary equipment and materials and iv) several expenses for the activities of the experts.

Known the project budget, its efficiency would occur if the value of the obtained production exceeds those from the value of investments made by the concepts enumerated in the previous paragraph. The higher the value of resulted production exceeds the value of investment, more efficient will be the project.

This relation can mathematically be obtained by the division between the *total cost of the project* and the *total value of production.* The closer near 0 is the value of this ratio the more efficient will have been the project. On the other hand, if the value of this relation exceeded 1 (the costs of the project exceed to the value of the obtained production), the project would have been inefficient.

In order to consider the value of production it is necessary to consider the following aspects:

1. All producers have not managed to commercialize their products starting from the implementation of the project (just the ones of San Pedro and Caaguazú). In order to simplify the estimation criteria, the evaluation in this period of implementation only must consider the volume indeed commercialized to date.
2. Some producers already produced beekeeping products before the implementation of the project. Therefore, it would only be necessary to consider the additional production obtained as a result of the implementation of the project.
3. A significant diversification of the beekeeping production has not yet been appraised. Therefore, up to this point of the evaluation it can only be considered the value of production of honey from bees.
4. The investments (costs) of the project are made during first two years, whereas the production is maintained indefinitely. In order to determine objectively cost indicator efficiency, it would be necessary to determine the horizon timeframe in which the evaluation will be made (for example 4 years).

Next the considered variables are summarized:

A) Number of producers that commercialize their production: 15
B) Additional production average obtained from the implementation of the project: 10 kg/beehive.
C) Average number of beehives per producer: 15,
D) Increase in the average number of beehives by each beekeeper: 7
E) Price of the product: G$ 15,000 by liter (21,000 G$ by kg).
F) Present Yield average: 14 kg/beehive.

In reality, the analysis varies when detailing information by each community. In the case of Atyrá, beekeepers already were beneficiaries of project IRC (MAG-BIRF) before, receiving each one 10 beehives on donation, which were not totally in production, thus the effective increase average was negative (-1 beehive per beneficiary). In the case of Calle Bertoni, the average increase of the number of beehives was of 10 per associate, and in JM Frutos the average increase was of 12.4 beehives by interviewed person, which are attributable to the Project.

Benefits of the project:
A) By increase in the number of Beehives: 7 beehives x 15 producers x 14 kg x 21,000 G$ = G$ 30.870.000

B) By increase in the yield of beehives. 8 beehives x 15 producers x 10 Kg x 21,000 G$ = G$ 25.200.000 Total
C) Total (A + B) = G$ 56.070.000 (USS 10,700 to an exchange rate of G$ 5,200 by each US$).

The present cost benefit relation (US$ 182,600/US$ 10,700) suggests the project not yet reached efficiency in this aspect. Nevertheless, it still can be early to evaluate this criterion on the basis of the considered parameters. It is suggested to reiterate the evaluation in more advanced periods with respect to the project implementation (ex--Post Evaluation).

In the cases of Sapukai and Atyrá, it even was not gotten to obtain the first harvest, thus this type of evaluation is premature. In the cases of Calle Bertoni and JM Frutos, an important increase in the produced volume was obtained.

4.2 Development of activities on the basis of planning.

The project plan establishes 7 great lines of action to reach the predicted objectives and results. These lines later are detailed in 15 established activities in the tentative plan of operation (TPO). The main lines of actions are exposed next:

I. Selection of "model" producers.
II. Selection of the premises in each one of the 5 departments.
III. Selection and training of local base technicians and extensionists from DEAG.
IV. Elaboration of the regulations of standardization and operation for the beekeeping department of MAG.
V. Maintenance of the laboratory equipment to strengthen the quality controls of beekeeping products.
VI. Elaboration of an execution plan for the base technicians and beekeepers training.
VII. Elaboration of a plan for integral management of diversification of Beekeeping in Paraguay

Through the conversations maintained with the beekeeping technicians from DIPA, the evaluation team has been able to conclude that most of these lines of action have been developed in activities. The only attachment lines that have not been developed are the ones identified in numerals IV and VII. On the other hand, the actions corresponding to numeral V have been partially developed.

In the case of the "Elaboration of the Plan for Integral Management of Beekeeping diversification in Paraguay", the DIPA technicians declared that it could not be made, as for the diversification zoning. This occurred because of the lack of certain equipment, such as the pollen trap.

When comparing the activities developed with the planned ones in the tentative plan of operation (see annex), it can be concluded that the following activities have not been developed or they have not been completed:

- Selection and training of base technicians (numeral 2, 2 of the TPO): it has not been developed this activity in the Chaco region.

- Selection of the premises for the model storing and gathering center (numeral 2, 2 of the TPO): it has not been developed this activity in the Chaco region.
- Training courses for counterpart technicians (numeral 2, 7 of the TPO): the DIPA technicians mentioned that it was not totally accomplished since training and study scholarships in other countries were not granted. Nevertheless, the qualification form was not specifically established in the project design.
- Technological transfer to producers on pollen harvest (numeral 2, 9 of the TPO): It would not have been made by lack of equipment.

The details mentioned in the preceding paragraphs suggest the project has been implemented with relative efficiency. Although all the anticipated activities have not been fulfilled, most of them have been developed within reasonable terms of timeframes with respect to planning. In addition, also numerous non planned activities have been developed like which those that are mentioned next:

- Publication of a manual for beekeeping (bibliographical material).
- Donation of beehives and equipment to committees of limited resources.
- Donation of sugar and stamped wax.
- Purchase of chart-motorcycles (for transportation).
- Management and obtaining of a sale place in the Asuncion Wholesale Market.

A weakness found in this criterion of evaluation is the lack of documentation of the adjustments made to the project. The activities and expected results that have been initially programmed can undergo alterations during the implementation of the project but they would have been documented with the pertinent adjustments to the Project Design Matrix (PDM) and to the Tentative Plan of Operations (TPO).

4.3 Resources assignment according to planning

The resources assignment is an indicator suitable enough to measure the efficiency of the project implementation. It is considered both the execution as well as the adequate use of financial resources. The proper use of other resources such as human and infrastructure should also be considered.

It has not been found elements that suggest an inadequate use of financial resources. The majority of activities have been performed in time and form, which suggests that those resources have been available for support.

DIPA assigned the main counterparts for the Project, accompanying to the expert in all their visits and activities. In the case of DEAG, some locations lacked the opportune allocation of local base technicians, which produced delays until its fulfillment by the institution. This caused in addition a delay in the training activities which were fulfilled just in the month of February 2007.

It was emphasized finally that in case of continuing the project in another phase, the DIPA technicians could continue with the same type of support in new communities, but that the previously assisted ones would have to count on the periodic support of the local base technicians from DEAG.

The project has counted in general with the effective dedication of its specialized in beekeeping counterparts. As far as the local base technicians, in the sites where they knew about beekeeping the support was superior to the one at the localities with non specialized technicians, or not assigned in the predicted time. Effective use of infrastructure compromised, mainly refers about the construction, equipment and operation of the Gathering and Storing Centers in the communities attended by the project, having been satisfactory in the most advanced committees.

4.4 Factors that contributed to meet or restrict the efficiency of the project.

The DIPA of MAG has counted with sufficient resources for the implementation of the project. Also, the direction of agrarian extension of MAG (DEAG) has sufficient civil employees to assist the producing beneficiaries of the project.

In the specific case of the Project, it has contributed the financial, operative and investment resources in quick and opportune form, being positively different itself from other previous projects in this aspect. The project contemplates donations of equipment and inputs in small amounts for demonstrative aims that served to accelerate the process of adoption of techniques transferred in the training.

The technicians from the Ministry of Agriculture and Livestock think that the infrastructure has been adequate and sufficient enough for installing the gathering and storing centers, obtaining the approval from SENACSA according to the norms of MERCOSUR. Nevertheless, they have mentioned concern with respect to the incomplete infrastructure available in the laboratory of beekeeping belonging to MAG. Also, deficiencies of inputs appear occasionally by lack of opportune payments.

5. - Impact of the project.

In the impact evaluation it is tried to measure up to what degree the project has been able to fulfill its superior goal. Many of the aspects considered for this determination already have been boarded within the criterion of effectiveness in this evaluation. However, the measurement variables are more specific than those previously used, which can be of utility for contrasting findings.

Other indicators that have been considered to measure the impact of the project bear relation to i) the fulfillment from the assumptions established in the project design matrix (PDM), ii) the positive and/or negative externalities which have been observed, and iii) the dispersion of the benefits from the program between neighbors and close friends of the initial beneficiaries.

5.1. Fulfillment of the project superior goal.

In order to verify if the project has reached the drawn up superior goal, the beekeepers beneficiaries have been investigated about the recent evolution of their indicators of production. The main considered indicators are: i) whatever declared to have increased their income, ii) whichever beekeepers declared to have increased the number of beehives and iii) whichever beekeepers would have increased their production or would have possibilities of doing it.

As it has been mentioned in the section that evaluates the effectiveness of the program, 60% of the producers have declared to have increased their income from the implementation of the program. Considering the period passed from the beginning of the implementation, the before mentioned proportion suggests that the project has had an important positive impact. However, the evolution of this indicator would have to be monitored later to verify if more producers perceive a higher income by beekeeping activities.

Most of those that reported higher income belonged to the most advanced committees of Caaguazú and San Pedro, whereas in the rest their degree of initial weakness was just in time of being surpassed in the first expected harvest during the present year.

When analyzing the evolution of the number of beehives per each producer, we could state that 13 producers increased the number of beehives, 5 producers maintained the same amount, and only two producers reduced their number of beehives. Among the producers that have increased their beehives, a great dispersion in the amount of new beehives between 3 and 31 boxes has been noticed, with a median of 8 beehives.

When detaching by Committees, the control beekeepers non members of the committees did not increase the number of beehives whereas in San Pedro it increased in average 10 beehives, and Caaguazú 12.4 beehives. In Atyrá there was no increase since they received 10 beehives donated by IRC out of which the majority was not even in production.

The indicators of production increase have been already previously discussed in the cost-efficiency section of the project. The analysis of the interviews indicates that 11 out of the 20 interviewed beekeepers would have increased the volume of production on an average of 10 kg of honey per beehive. Only 3 producers perceived a reduction of production whereas the other beekeepers could not respond to the question because they not had harvested yet.

In general terms it would be possible to be said that the project has had a relatively positive impact in the beneficiary population. More than half of the interviewed people declared to have increased its income and/or increased the production level. Nevertheless, also an important proportion of producers are appraised that have not noticed significant changes (equal or superior to 40%).

It would be interesting to analyze these indicators again when a longer period has passed from the beginning of the implementation of the project (ex--post evaluation)

5.2- Fulfillment of the assumptions of the project.

In the Project design matrix a series of external factors to the implementation has been identified that could have mitigated their impact. The identified factors have been: i) external effects on the bee's population (agrichemicals), ii) incidence of criminal acts on beehives (robberies), iii) incidence of social conflicts, and iv) adverse natural conditions. During the evaluation it has been verified if these adverse conditions have been pronounced or no.

One of the assumptions in which rested the success of the project is the "health" of the bee population of the beehives. A problem of probable incidence in the countryside is the poisoning of bees by agrichemicals. During the interviews applied to the producers it has been investigated if this phenomenon has appeared frequently, finding that it would not have represented a greater difficulty. Only 4 beekeepers out of the 20 interviewed people have had adverse effects by applied agrichemicals to cotton, watermelon, sunflower and soybean in neighboring parcels.

In San Pedro and Caaguazú is registered a great amount of cropping parcels in the surroundings of the committees members. In the case of Atyrá and Sapukai, practically did not existed cash crop parcels except for the traditional ones for self-sufficiency in which agrichemicals are not habitually applied. Moreover, in these communities the high potential of beekeeping is discovered for generating income to poor populations in environments unfavorable for other productive activities.

The high frequency of incidence of vandalism and criminal attitudes could have supposed a restriction to the positive impact of the project. Twelve out of the twenty producers interviewed have been victim of these facts, but it would not have harmed significantly their production. In most of the cases the incidents affected to a single beehive of the group and have been mostly isolated events.

It has been consulted to the technicians of the project on the possible derivation of the project in social conflicts. The perception of the interviewed people has been varied, since some think that the project would have consolidated the relations in some communities, whereas others observed that some conflicts have been generated. The cause of the identified conflicts was related with the administration of resources in the committees that do not count on clearly defined rules.

Finally, it has been consulted to the beneficiaries' beekeepers if they have suffered significant natural adversities that could negatively impacted the production. In this case has been appraised an important negative effect by climatic adversities in 80% of the interviewed people. The main identified adversity has been the excess of rains during the last months, which made difficult and retarded the honey harvest. Also frosts, droughts and heat excess have been identified.

5.3- Externalities observed.

An externality is a positive or negative effect caused by the implementation of a project, which has not been identified during the planning stage. During the evaluation design, it is been supposed if the attack of bees to individuals and the increase of certain insects can constitute negative externalities in this type of projects. On the other hand, the increase of the bee population can favor to the yields of crops by the pollinating function that bees fulfill.

The attack of bees to bordering human populations has not constituted a negative externality of the project. Only one of the interviewed producers was conscientious of the complaints, as well as just a single neighbor, by this problem. Possibly this risk has been considered during the installation of beehives, taking the forecasts measures from the case to avoid these incidents.

In the beekeepers perception, the production would not have derived either in an increase in the production of insect pests like flies. This type of externality

depends generally on the type of practices applied during the harvest, those that have been improved by the training provided and the infrastructure installed in the gathering and storing centers.

An important proportion of the interviewed people have perceived a positive externality in the increase of the crop yields by better pollination by bees. Nine of the 11 interviewed producers shared this perception. It is possible to emphasize that not all the beekeepers tied to the project count with diversified agricultural activities. Therefore, the number of beekeepers and crop farmers who share this perception receive greater importance.

5.4- Diffusion of the program to the non beneficiary population.

Finally, the present evaluation has tried to measure the impact of the project in the diffusion of this activity to population that originally does not have been tied. For this purpose it has been consulted to technicians and producers on the potential interest of other producers, or the adoption of this activity and the technology diffusion among the committee members' neighbors.

Beekeepers and technicians agreed in their perception by which numerous neighbors exist who is interested in the incorporation of beekeeping to their productive activities. A producer interviewed got to identify up to 20 neighbors interested in dedicating to this activity. It is possible to emphasize that at least 18 of the 20 interviewed people know at least a neighbor interested in dedicating to the beekeeping production.

Desire to incorporate the apicultural production often surpassed the simple verbal expression, since many neighbors have acquired beehives motivated by the observed results among the beneficiaries of the project. More than half of the beekeepers interviewed have observed at least a neighbor having beehives installed to produce honey bees.

The "expanded supply" of beekeeping products would not have had an impact in a better commercialization of the items. Most of the neighbors who incorporated the activity repeated the patterns of individual commercialization at local level that already were observed among the beneficiaries of the project. Also some exceptions are appraised that send their products to important centers of consumption which are at short distance. It has not been stated that these neighbors take advantage of the storing and gathering centers infrastructure that the project has installed.

The benefited beekeepers with the project supports have not had objections in sharing the learned techniques with their neighbors who are incorporating the beekeeping production. Around 70% of the interviewed people have declared to have advised their neighbors (non tied to the project) during the productive activities.

6. - Sustainability and gender approach in the project.

The sustainability evaluation analyzes the possibilities of persistence of the project achievements in the long term. This criterion of evaluation considers three dimensions as well: i) the financial and economic which analyzes the possibilities of funding the activities and infrastructure once the external contributions finish; ii)

the environmental one that analyzes that there are not negative impacts on the environment as a result of the project implementation, and iii) the social one, that considers the consolidation of the producers beneficiaries of the program organizations.

The sustainability of the projects is generally evaluated after some time has passed from the activities culmination. In this phase of implementation, we only can make some projections on the possibilities of sustainability of the intervention achievements. For this we have considered four groups of indicators: i) Those related to the maintenance of physical investments, ii) Those related to the support of training, iii) indicators of environmental impacts, and iv) indicators related to the sustainability of the beekeepers committees.

6.1- Maintenance and/or replacement of the physical investments of the project.

The project has made important physical investments in the centers of storing and gathering as well as in the laboratory of beekeeping of MAG. The equipment in which investments have been made requires of maintenance and many types of equipment require to be changed once they are worn away. This section analyzes if the committees of producers and the laboratory of the MAG count on sources of income sufficient to face the financial requirements that suppose these expenses. An initial phase constitutes the approximated quantification of these costs and elaboration of budgets.

The regulations of use of the gathering and storing centers have foresee rent collection. Nevertheless, it has not been stated during the interviews that the representatives of the committees become aware of the cost of maintenance of this infrastructure. Therefore, the determination of the rent to be collected tends to be arbitrary and not necessarily responds to the financial resources requirements for the infrastructure maintenance.

The beekeeping laboratory of MAG services are very sparsely required by beekeepers of this project. This fact has motivated a restructuring of the project, which put less emphasis in the strengthening of this laboratory. It is possible to mention that the laboratory operations were not sustainable with their collections before the implementation of the project. A test of the financial unsustainability of the laboratory has been the worn out equipment that had to be repaired with the project funding because MAG lacked resources for that purpose.

The experience suggests those physical investments have little possibilities of functionally lasting if suitable financial and administrative strategies are not developed. Nevertheless, these components have not been considered during the design of the program.

6.2- Possibilities of support of the training programs.

The benefits thrown by the training programs also can dissipate in time for not finding ways to maintain the events. The training support as a public good depends on the availability resources from pertinent governmental institutions. On the other hand, the training can be maintained by the own beekeepers if they sufficiently value it so that can pay for it. This section has analyzed both aspects

The Ministry of Agriculture and Livestock counts on qualified human resources although they are not being renewed with new incorporations in the needed degree. The human resources assigned to supporting beekeeping activity have tended to diminish with the years, and this fact puts in risk the sustainability of any type of intervention that looks for the beekeeping consolidation. The availability of travel allowance for the transfer of the technicians usually shows interannual variations, but the tendency suggests that resources for this item are becoming limited.

On the other hand, the interviewed beekeepers showed a high esteem to the benefits of training which suggests a stability of the "demand". This fact can serve as a pressure or incentive so that pertinent governmental institutions endorse with financial resources their strategies of intervention on beekeeping. Many producers have declared to make use of part of their resources to continue receiving these benefits, but this "expression of desire" not yet has been corroborated with real experiences.

5.3- Negative environmental effects.

During the field compilation tasks, it has not been stated the incidence of negative environmental impacts as a result of the implementation of the project. In the impact section it has been analyzed if the project has increased the population of domestic insect pests, or generated health risks to the bordering population. None of these effects has been verified, at least on a significant way. The interviewed producers neither have identified other not predefined adverse environmental effects in the design of the evaluation.

5.4- Degree of consolidation of the beneficiary's organizations.

In order to measure the degree of consolidation of the beneficiaries' beekeepers productive associations, the frequency of meetings of these groupings has been investigated, as well as the degree of "legal" formality and the evolution in the number of members. It is assumed that the committees with frequent meetings, legal function promoted and growth in the number of associates tend to consolidate.

About 90% of the beekeepers interviewed are associated to some type of local organization. This fact denotes a high shared social capital among the producing beneficiaries of the project. Around 80 % of the partners participate in the meetings of their base organizations at least 1 time monthly; 45 % meet twice a month and 15 % meet with a weekly frequency.

Most of the beekeepers organizations have with several years of operation. Only 20 % of the interviewed people have declared to be a member of groupings with less than 2 years of constitution. The older organizations that have been identified count with more than 20 years of existence.

An average producers committee count with between 10 and 12 partners, a minimum number of 7 and a maximum of 21 associated members. The committees' show a high mobility of membership since the majority of them has registered associates incorporations and retirements during the last year, but is appraised a tendency towards growth in the number of members.

The degree of advancement in the legal entity constitution shows some variations. From the older committees that are already formally constituted up to those of recent creation which count with their management steps proceedings.

5.5- Effect of the project in the alteration of gender roles.

The realized interviews suggest that beekeeping tends to be a male or an eminently familiar activity. The 40 % of the interviewed people declared to be in charge of the tasks whereas the spouses dedicate themselves to other tasks. Another 40% of interviewed people have showed that the activities are developed jointly by the couple and, sometimes, also by the children. Nevertheless in the young couples the children were still too young or minors students. Only 10 % of the interviews suggest that beekeeping is an activity developed by women.

A great majority of the interviewed people has showed that the traditional gender roles have not been modified as a result of the implementation of the project. Others have noticed some changes, but rather with respect to the traditional responsibilities of their children.

7.-Recomendations

In case of continuing the Project in a second stage, it is recommended to repeat the process of training by stages undertaken in the present project. The new Committees would have to receive basic training on technology for honey production and its hygienic processing in Centers of Gathering and Storing. In the already consolidated Committees of the first stage, the training should be able to focus on production and suitable processing of other beekeeping products, with higher added value and more diversified.

One of the main recommendations to improve the performance of the technical assistance consists of locating at the base level specialized in beekeeping extensionists, in order to obtain an effective follow up to the committees.

It is recommended that in case of continuing the Project, the same one should be concentrated in consolidating the attended committees, and to stimulate the sprouting of new committees in the same locations, which can lean on the experience of first ones and, they could accede to the services of the already installed Centers of Gathering and Storing. With this it will be avoided the dispersion of the project in detriment of the effectiveness and efficiency.

In the case of the Chaco region, the project will have to decide the strategy to follow, considering the manifested will of the Vice ministry of Livestock to impel in the region the beekeeping product production with good quality for its market sale. The ministerial specialists consider that in that zone could be produced honey with certified organic quality, concentrating specifically on honey and pollen production.

Another criterion for selection of beekeepers consists of identifying previously the committees formerly attended by other national projects or from international cooperation, considering the investments already received by such (beehives, equipment, clothes, smokers, and inputs such as: stamped wax, and antibiotics).

In relation to the location of the Centers of Gathering and Storing although the decision must be based on a local analysis of its advantages and disadvantages,

as far as the infrastructure they would have to be preferably been located at the premises of Committees property. This is considering that must be carefully analyzed in each case the property of the infrastructure and the donated equipment, as well as the rights of use. The construction of the Centers of Storing was made by construction companies under the modality "key in hand", which is recommended to continue given the suitable quality of the constructions.

The local base technicians assigned to the committees must be sufficiently specialized and with a more periodic dedication so that the technical assistance can obtain greater effectiveness. Also, it is required periods of follow up at medium and long term to achieve results consolidation.

In relation to the training to the producers it is recommended to continue with the practical and theoretical formation, accompanying locally by a periodic and persistent way the production cycle in all stages. Also, the achievement of concrete results is assured by the opportune provision in small donations of inputs or missing equipment, given the level of initial poverty from the Committee members.

The local experience acquired by the attended Committees can turn out to be very effective to obtain the transmission of knowledge and experience in a horizontal way between the own settlers of every zone.

For the future production of green propolis it is fundamental to previously evaluate the honey flora source of every zone, since the presence of species like the *Sapiranguy*, and others can affect the coloration and therefore the commercial quality of the final product.

In case of continuing the project, it is recommended to advance in the initiative to make joint sales in the premises of the Asuncion Market of Wholesale Supply, with the purpose of evaluating its economic result and study the organization internal administrative modalities, in order to regulate the commercial operations.

7. - Learned Lessons

The experience demonstrated that stages cannot be advanced even in Committees that had an incipient bee's production, given their ignorance of numerous technologies for modern production. By this reason, the Project firstly had to train the producers on modern technologies for producing honey with productivity and quality, before trying the production of green propolis and pollen, which are more sophisticated products with higher commercial value.

As far as the counterpart institution, in case of continuing the Project, at the level of MAG it is not clear which institution would be the best suited in charge of coordinating with the other participant institutions (JICA/DEAG/DIPA).

Actually, the DIPA specialists in beekeeping accompanied to the JICA expert in their tours, counting in addition with the collaboration of base extensionists, but with scarce involvement of the beekeeping specialists form the central station of DEAG. Although the assumptions of "institutional Change" of the PDM did not appear at technical level (*frequent changes of authorities*), only a case of one technician transfer appeared in the Calle Bertoni Committee. On the other hand, in

some premises, the allocation of base technicians was made at different moments throughout the course of time.

The methodology of selecting producers that already were beekeepers previously to the project was quite right, when counting from the beginning with motivated producers. Considering that their production systems were mostly artisan and slightly informed, this contributed to the high valuation that they granted to the training received from the experts of the project.

Among the assumptions it appears "*the small beekeeping producers of every zone accept the anticipated activities in the Project*". On the basis of the previous paragraph statement, the assumption was certain. But, at the time of evaluating the multiplying effects for the future, it is evident that once initiated the project this attracts numerous apparently interested candidates, which soon deserted again when considering the efforts and investments that must persistently be made to obtain the goals. This point reveals the importance of maintaining this approach for the selection of beneficiaries.

The producers of the first stage have valued the project as far as the high quality of the received assistance, to the inputs and necessary equipment provision that acted like limiting factors given their condition of poverty, and to the close support and the timely interventions of the project, in contrast to other projects of the past, as a result of bureaucracy and the scarce and sporadic contact with technicians, nonresident in the region.

The previous projects impelled by the national programs or by international cooperation although they were effective in transferring resources and equipment to beekeepers committees could not, by diverse reasons, offer technical assistance and maintained follow up, being these latter factors those that prevented the results achievements. The JICA project was able to surpass these disadvantages, being fulfilled therefore the supposed "*Availability of resources*" for the fulfillment of activities anticipated in the PDM.

The two premises of the Center of Gathering and Storing were located within the facilities of DEAG (Calle Bertoni and J.M. Frutos). In the other locations, the Centers of Gathering and Storing were located in private lots. In the case of Sapukai, the lot was donated to the Committee by the Municipality. In Atyrá, it was built in an estate property of the Committee. In the Chaco case, the Center of Gathering and Storing forecasted at km 325 would be settled, in principle, in an infrastructure built by a previous project (PRODECHACO, UE/MAG). The learned lesson is that the decision must be made on a case by case approach, with participation of the involved public and private local actors. Another lesson consists in that it had not been possible to produce honey and derivatives with quality standards without counting on the infrastructure and equipment like the ones provided by the Project.

The local base extensionist's technicians were selected according to the identified premises. In general, the technicians who were in themselves beekeepers previously to the project demonstrated interest and took advantage of the received training from the expert and his counterparts, increasing their capacities, accompanying effectively to the committee partners. In the case of the extensionists who were not beekeepers and that in addition had other parallel

activities and responsibilities, could be noticed in the committees the necessity of more specialized assistance and a more periodic follow up.

The training provided to the producers of the committees was quite fitted, and also for the base technicians who previously were beekeepers themselves. The degree of advantage taken by the technicians without previous experience in beekeeping was more limited, requiring longer time in becoming experts in this specialty.

The modality by which the own members of the committees participated in their regulations of use of infrastructure elaboration for the Centers of gathering and storing turned out to be quite fitted. Most of the interviewed people declared to know the most important aspects for processing and the cleaning and quality requirements for the obtained product.

The training and technical assistance to the producers made by the expert and his counterparts on a practical and theoretical basis in the own committees associate's beehives were very effective for technology transfer. The favorable opinion was unanimous, in contrast to other previous projects with excessive emphasis on the theoretical formation that did not have the persistence nor the required depth to obtain the adoption of technologies. The producers consider that the acquired capacities radically changed the results obtained in productivity and quality, resulting finally in an increase of production and income. Several times they stood out that they only knew very rudimentary beekeeping methods for production, previously to the project. This assertion was evidenced by the parallel interviews realized to the producers who were non committee's members, which continue with the traditional methods, and in numerous cases they consult to the assisted neighbors on the way to improve the handling of their beehives.

Another aspect emphasized by the committees' members was the timely provision of inputs and products donations according to the need of removing limiting factors and to teach the new practices (winter handling, additional feeding, demonstrative smaller equipment and beehives, among others). The training and technical assistance was not limited to mere recommendations, demonstrating itself with concrete results the value of the transference.

The objective by which the project assisted beekeepers duplicate their production of honey and wax was more than fulfilled in the most advanced Committees (Calle Bertoni and Juan Manuel Frutos). In the other localities, the committees just were close to harvest for the first time. The strategy was to increase both the number of beehives and the yield per beehive. The learned lesson is that the achievement of this result is possible thanks to the technological change and the timely provision of production inputs during the winter phase. Here they are radically different from the traditional beekeepers that ignore these aspects.

Considering the assumption of "*Robbery of beehives*" the evaluations detected this case in most of the surveyed ones, but on a sporadic frequency. The learned lesson is that the beehives would have to be in less exposed or more isolated zones, and that frequent weekly visits for their better control are required.

In relation to the assumption of "*Increases of agrichemical* ", the majority expressed that they did not detect effects. In numerous cases, the zone was not apt for cash crops, existing abundant native vegetation. In other cases, the beehives were installed near the urban plant and surrounded by native vegetation