

Profitability and Marketing Options for Small-Scale Honey Producers in Campeche, Mexico

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Abstract: Establishment of food safety and quality standards for honey produced by small-scale beekeepers in nations of the global South has provoked changes in production and marketing. This study evaluates profitability of conventional and organic honey produced by small-scale beekeepers of the Mexican State of Campeche for national and international markets. The study discusses restrictions and potential for beekeepers' to access these markets. Information was obtained through questionnaires, community-wide workshops and interviews with key actors. Results show that profitability of conventional honey for the domestic market is 23% greater than for exported organic honey and 32% greater than for exported conventional honey. Nevertheless, the domestic market is characterized by a low level of honey consumption as well as insufficient control over quality and food safety. One option for developing this market is to strengthen small-scale self-managed beekeeper's organizations.

Key words: Honey profitability, honey market, small-scale farmers, self-managed organizations, Mexico

INTRODUCTION

Small-scale farmers are responsible for the majority of agricultural production in Mexico. In 2007, each of 4.1 million agricultural production units cultivated average of 3.8 ha. The same year, 6.5 million hectares were cultivated with white maize, the basic food in the Mexican diet, average plot size was 2.8 ha. Coffee and honey, two export products for which Mexico is renowned worldwide are mainly produced by small-scale farmers. From 2009 to 2011, Mexico was the fourth largest honey exporter and the tenth largest coffee exporter (FAOSTAT, 2013). According to government statistics, 66% of Mexico's 486,000 coffee producers are small-scale indigenous farmers with an average of 1.3 ha each. Mexico's 41,000 honey producers manage an average of 44 hives each with an average honey yield per hive of 31 kg.

The Yucatan Peninsula is Mexico's principal honey producing and exporting region. From 2000 to 2009, 32.7% of honey produced in Mexico and 65.8% of honey exported by Mexico was produced in this region. During the same time period, Campeche one of the Yucatan peninsula's three states was Mexico's second largest honey producer, responsible for 12.6% of all honey produced in the country.

Most farmers of the Yucatan Peninsula are small-scale producers of Mayan origin whose family strategy combines use of a variety of resources found in the local environment with work as wage labor (Pat-Fernandez *et al.*, 2011). It is very difficult for these small-scale farmers to comply with Mexico's strict regulations regarding sale of conventional and organic honey for export. With the goal that Mexican honey be accepted in the external market since, 1998 the Secretary of Agriculture, Livestock Raising, Rural Development, Fishing and Food (SAGARPA) has implemented stricter honey standards and regulations regarding quality.

In general in Mexico, small-scale producers whose products are oriented toward export including the beekeepers in question are immersed in markets controlled by global agribusiness chains made up of retailers and brand marketers (Lee *et al.*, 2012). These chains base their competitiveness on differentiating their products from those of their competitors, food safety and quality in order to respond to ever more demanding consumers (Readon *et al.*, 2009; Gomez *et al.*, 2011). Businesses that lead the market purchase from a small number of large-scale distributors capable of meeting strict food safety and quality standards (Maertens and Swinnen, 2009).

For small-scale farmers, access to these markets is difficult as it generally involves high marketing transaction costs due to insufficient physical and financial infrastructure, limited information regarding market demands and lack of negotiating power with other actors in the chain (Kruijssen *et al.*, 2009).

Thus, the principal options open to small farmers are to adjust their products and production processes to standards imposed by the market by innovating in order to improve their living conditions as well as their competitiveness (Perez-Aleman, 2012) or to leave farming and emigrate to urban centers within Mexico or to United States thus, losing thus their land and abandoning their culture (Taylor *et al.*, 2005).

Given this context, the objectives of this study are: to characterize honey production and marketing chains in the state of Campeche and to evaluate levels of profitability for small-scale conventional and organic honey producers who market their product within the state as well as those who export or do both in order to identify limits to and potential for entering these markets.

MATERIALS AND METHODS

The study was carried out in central and Southern Campeche, Mexico. In 2012, 67% of honey produced in Campeche came from these areas of the state. Three villages representative of beekeeping in these areas were selected for the study in the South, Sabancuy of the

municipality Carmen and Haro of the municipality Escarcega and in the center Felipe Carrillo Puerto of the municipality Champoton (Fig. 1).

These villages were populated principally by Mayan migrants from other areas of Campeche in the early 1900s and migrants of other Mexican States in the 1960s. Currently, the municipalities to which these communities belong are characterized by high poverty rates in 2012 an estimated 41% of the population of the municipality of Carmen lived in poverty, 63% in Champoton and 73% in Escarcega.

The predominant climate of the study area is warm semi-humid with Summer rains and a significant portion of the Southern region has a humid climate. Median annual temperature of both regions varies from 26-27°C. The two regions differ significantly in median annual precipitation: in the center precipitation ranges from 1000-1400 mm and in the South from 1400-2200 mm.

With respect to vegetation in the center, low subperennial jungle and medium subcaducifol and subperenifol jungle are predominant. In the South, medium subperennial jungle, high subperennial jungle, low subperennial jungle and mangrove swamp are the principal vegetation types. Such vegetation allows for a wide diversity of honey and pollen producing species in the mountainous region of Campeche, over 100 species belonging to 67 genera and 31 families have been identified. The species Dzitzilche (*Gymnopodium antigonoides*), Tajonal (*Viguiera dentata*) and Xtabentun

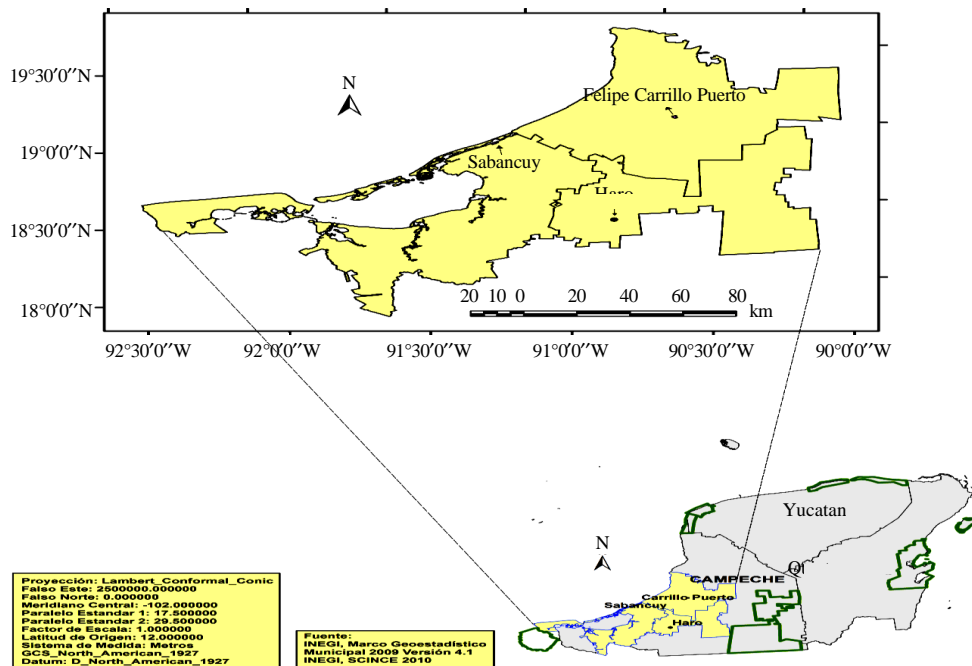


Fig. 1: Geographical location of the study area

(*Turbina corymbosa*) which flower during Winter and Spring are some of the most important honey producing plants. Reports indicate that 80-90% of honey production in the Yucatan Peninsula occurs while Dzitzilche and Tajonal are flowering (Echazarreta *et al.*, 1997).

Information was obtained using a structured questionnaire consisting of two sections: beekeeping costs and income and socioeconomic data. For this, 63 beekeepers were randomly selected: 17 from Sabancuy, 19 from Haro and 27 from Felipe Carrillo Puerto. Field data were collected from March to July 2012. The concept of profitability used was based by Varian and Repcheck (2010). The Organization of United Small Beekeepers of Latin America and The Fair Trade Labeling International Organization (FLO).

The study on beekeeping costs and income included fixed and variable costs. Fixed costs considered were family labor, equipment and replacement of queen bees. Variable costs were hired labor, sugar to feed the bees, disease prevention and treatment, harvest and transport. Costs of transport, capital and family labor were estimated based on their opportunity cost. Cost of equipment and replacement of queen bees was calculated taking into account the value of their annual depreciation.

The socioeconomic section included information regarding: employment and income, family composition, formal education level, membership in beekeeper's organizations and all agricultural production. Information from the questionnaire was validated in a participatory workshop in each community using the Focal Groups Discussion Method. Groups consisted of leaders of beekeeper's organizations, elected village leaders and others interested in the study.

Data from the questionnaire were analyzed using the statistical packet SPSS, Version 20. With data on costs, prices and quantities sold, the functions for Total Cost (TC) and Total Income (TI) were estimated through a regression analysis. High production levels, though few were not eliminated from the sample as they allow for showing all levels of production and efficiency for beekeeping in Campeche. With the functions for TC and TI, the function for profits was formulated ($P = IT - CT$) and profitability of conventional honey for export was calculated for all production levels in the study area. Furthermore, profitability of conventional honey sold within the state was calculated as well as that of organic honey for export for which a cost of production 70% greater than that of conventional honey was used due to cost of acquiring new equipment and certification (Guemes-Ricalde *et al.*, 2006).

In order to identify marketing channels and determine purchase and sale prices of the honey throughout the productive chain, key informants were interviewed including producers, middlemen and representatives of beekeeping organizations.

RESULTS AND DISCUSSION

Characteristics of beekeeping: Beekeeping is the most important economic pursuit for 10.4% of the estimated 2,180 families in the communities studied. Most families in the study that practice beekeeping carry out at least two other economic activities which vary from one family to another, although beekeeping provides the basis for their income. Most beekeepers in the area have small apiaries with an average of 49 hives and an average yield per hive of 33.4 kg (Table 1). Beekeeping is principally carried out using family labor, though additional labor is typically contracted during harvest time. Most beekeepers are relatively older, average producer age was 48. The local environment is favorable for beekeeping due to relatively large family landholdings which allow farmers to leave a large area under natural vegetation (>60 ha/family) (Table 2). As indicated in the table, number of hives, yield and production per hive are greater in the study area as compared to the national average and that of the Yucatan Peninsula.

Family income: Table 3 compares income sources of families that practice beekeeping with those that do not. Income is grouped into three categories: agricultural income, non-agricultural income and subsidies. Most families adopt a strategy of carrying out multiple economic pursuits in order to make ends meet on a daily basis.

Families that practice beekeeping obtain the largest share (71.13%) of their income from agriculture, beekeeping provides 44% of their entire income. Other important agricultural activities which generate income and provide food are traditional milpa (maize intercropped with beans, squash, etc.) and livestock raising. Families that do not practice beekeeping receive the largest portion of their income from non-agricultural activities (49%) especially services (22.1%) such as transportation and small businesses. Extensive cattle raising which competes

Table 1: Population and sample of beekeepers in the study communities, 2012

Communities	No. beekeepers (N)	Sample (n)	Percentage n compared to N
Sabancuy	48	16	33.4
Haro	46	19	41.3
Felipe C.P.	133	27	21.0
Total	227	63	27.7

Table 2: Characteristics of beekeeping in the communities of the study area in the Yucatan Peninsula and in Mexico

Characteristics	Study area	Mexico	Yucatan Peninsula	
	2012 ¹	2012 ²	2003 ³	1997 ⁴
Number of economic pursuits per beekeeper	3.00±0.91	-	-	-
Number of hives per beekeeper	49.60±31.3	45.00	28.00	40.00
Average yield per apiary (ton)	1.67±1.20	1.39	1.05	1.28
Production per hive (kg)	33.40±8.90	30.90	37.50	32.00
Family size	3.98±1.50	-	-	-
Beekeeper age (years)	48.15±13.6	-	-	47.00
Formal education level of family (average years) ⁵	6.60±2.48	-	-	-
Beekeeper's formal education level (years)	5.10±3.90	-	-	5.00
Average size of land holding per beekeeper (ha)	60.20±12.8	-	-	-

¹Original table based on information from questionnaire; ^{2,3}Estimated based on historical information from SIAP and Gumes-Ricalde *et al.* (2006), ⁴Echazarreta *et al.* (1997); ⁵for family members age 18 and older; spaces market with dash indicate data unavailable

Table 3: Income structure of families in the study region

Income source (Mexican pesos)	Families practicing beekeeping (10.4%)	Families not practicing beekeeping (89.6%)
Agriculture	10,485 (10.19%)	7,083 (11.18%)
Livestock	16,012 (15.56%)	9,826 (15.51%)
Beekeeping	45,286 (44.02%)	0
Backyard garden	1,385 (1.34%)	475 (0.74%)
Fishing	0	2,886 (4.55%)
Total agricultural Income	73,168 (71.13%)	20,270 (31.99%)
Construction	7,175 (6.97%)	13,167 (20.78%)
Diverse services	11,120 (10.81%)	14,007 (22.11%)
Remittances and pensions	1,894 (1.84%)	4,258 (6.72%)
Total non-agricultural income	20,189 (19.62%)	31,432 (49.62%)
Oportunidades ¹	5,312 (5.16%)	5,224 (8.24%)
Procampo ²	3,326 (3.23%)	5,191 (8.19%)
Progan ³	864 (0.83%)	1,050 (1.65%)
Total subsidies	9,502 (9.23%)	11,465 (18.09%)
Total	102,859 (100%)	63,345 (100%)

Original table based on information from the questionnaire. ¹Opportunities: Federal program to promote human development of families living in extreme poverty; ²Procampo: Federal program of direct payments to farmers; ³Progan: Federal program to support livestock raising

for space with beekeeping given that it involves removing vegetation, provides 15% of income for both groups of families. Subsidies provide a greater percentage of income to families that do not practice beekeeping (18%) than to those that do (9.2%).

Types of honey and marketing channels: Marketing honey involves relationships among primary actors (those involved in production, transformation and sales) and secondary actors (those providing services to primary actors such as technical advisory, credit, health inspection and sale of inputs) here researchers only discuss the first. As shown in Fig. 2, Campeche two types of honey are produced conventional and organic which are sold through three marketing channels.

The first which involves the greatest volume is conventional honey for export, marketed through the channel farmers-local middlemen-farmers' organizations and private businesses-exporters. The second is conventional honey for sale within the state, marketed through the channel farmers-local retailers. The third, organic honey for export is sold through the channel farmers-exporters. Thus, beekeepers have three sale options: local middlemen, local retailers and exporters. It is estimated that 90% of Campeche's honey harvest is marketed through the first channel, 9% through the

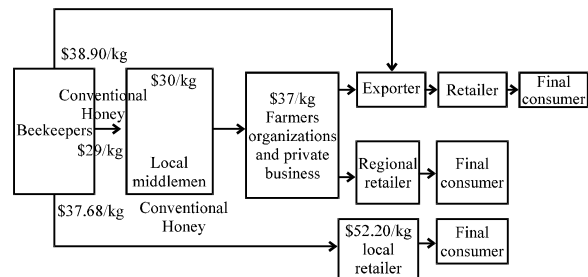


Fig. 2: Productive chain and sale price of honey in Campeche, Mexico, 2012. Original diagram based on interviews of key informants; prices are in Mexican pesos. Average exchange rate in 2012 per US dollar was 13.16 Mexican pesos

second and 1% through the third. Honey marketing in Campeche is controlled by five organizations: the society of Social Solidarity of Honey and Wax of Campeche (MYC) the Society of Rural Production of Beekeepers of Champoton (AP) Miel-Mex, Citrofrut and Maya Honey. The first two are farmers' cooperatives and the others are private businesses.

In the village Felipe Carrillo Puerto, most beekeepers are affiliated with AP and sell to AP. In Sabancuy, beekeepers have been affiliated with the cooperative

society of Estauche but this organization is in the process of disintegration and former members now sell principally to AP.

Profitability of honey: The term profitability is used to measure economic efficiency of a product and thus evaluate its behavior in the market. With information for cost of honey production, the function for total cost was estimated (Table 4).

The function for estimated cost ($6,594+10,244Q-700Q^2+39Q^3$) represents conventional honey for export marketed by small-scale beekeepers through the predominant channel: farmers-local middlemen-beekeepers' organizations (Cooperatives) and private businesses-exporters. The function for income in this channel is price per ton paid to the beekeeper for the quantity of honey sold (29,000Q). The function for profit ($-39Q^3+700Q^2+8,756Q-6,594$) is the difference between the function for income and the function for cost (Table 5).

Marketing of conventional honey for the state market through the channel farmers-local retailers has the same function for cost as conventional honey for export. Nevertheless, beekeepers' sale price in the state market is 30% greater than that of conventional honey for export (Table 5).

Marketing organic honey through the channel farmer-exporter has a cost 70% greater and a price 34% greater than for conventional honey for export marketed through the channel farmers-local middlemen-farmers' organizations and private businesses-exporters (Table 5). Profitability of types of honey marketed through the different channels was estimated based on the most frequent production levels in the study area (Table 6).

Beekeepers of the study area produce from 500 kg to 20 tons of honey per year. The highest frequency of yield (27%) is 1.5 tons. Table 5 shows estimates of profits for beekeepers according to their production levels. Beekeeper's mean annual profit (for all levels of

production) was estimated at \$111,000 Mexican pesos for conventional honey channeled by local middlemen and \$163,000 for those who sell to retailers. Annual profit for those who produce organic honey for export was \$126,000.

Characterization of beekeeping: Beekeeping in the region studied as in the rest of the Yucatan Peninsula is carried out principally by small scale farmers (Echazarreta *et al.*, 1997; Guemes-Ricalde *et al.*, 2006). Typically, beekeeping is complementary to the Slash and Burn (SB) peasant agricultural system. The SB System provides basic foods for family consumption and beekeeping provides monetary income. According to some researchers this mixed system persists because it minimizes risk to the farmer who in this manner controls his means of subsistence and maintains a certain level of autonomy with respect to the dominant market (Merrill, 1984; Guemes-Ricalde *et al.*, 2006). Other researchers point out that the strategy of these families is based on managing a variety of resources (milpa, beekeeping, extraction and gathering of forest resources, hunting and fishing) allowing them to maintain a dual economy based on production for self-subsistence and sale of excess products. Nevertheless, recently families of this region have greatly diversified their income sources toward non-agricultural activities such as construction, factory work, services and remittances (Pat-Fernandez *et al.*, 2011). The relative importance of beekeeping to family income varies among communities and regions of the state according to the dominant income strategy. For families whose income strategy is based on agriculture in northern Campeche, beekeeping provides only 2.7% of total income (Pat-Fernandez *et al.*, 2008) while in the South-center it provides 44%. The economic strategy and the importance of each economic pursuit vary among communities and families. In a study, Schuren (2003) in Mayan communities of Hopelchen, Campeche, economic strategies varied among communities and families these strategies depend on access to capital and land, distance to locations with research opportunities, social networks, family structure and organization, government programs, government price policy and market demand.

The strategy of multiple economic pursuits which have varying levels of integration to the market has not weakened honey production or quality. This is due to at least four factors: first, producers possess ancestral

Table 4: Estimation of the function of cost of production for honey in Campeche, Mexico, 2012

Regression	Coefficient	p-values	Sig.	Adjusted R ²
Cubic				
Constant	6.594	0.060	*	0.91
Q	10.244	0.000	***	-
Q ²	-700.000	0.078	*	-
Q ³	39.000	0.009	***	-

Total cost: dependent variable; Yield (Q): independent variable; the coefficient is significantly different from zero: 90%*, 95%**, 99%***

Table 5: Function for cost, income and profit of conventional and organic honey in Campeche, Mexico, 2012

Type of honey	Total Cost (TC)	Total Income (TI)	Profit (P = TI-TC)
Conventional Export	$6,594+10,244Q-700Q^2+39Q^3$	29,000Q	$-39Q^3+700Q^2+8,756Q-6,594$
Conventional Local	$6,594+10,244Q-700Q^2+9Q^3$	37,680Q	$39Q^3+700Q^2+27,436Q-6594$
Organic export	$67Q^3-1,191Q^2+17,417Q+11,549$	38,902Q	$-67Q^3+1,191Q^2+21,485Q-11,549$

Estimated based on the questionnaire regarding socioeconomic data

Table 6: Estimated honey profits according to level of production in Campeche, 2012

Yield (tons)	Percentage of beekeepers	Profit (Mexican pesos)		
		Conventional export	Conventional local	Organic export
0.5	4.76	2.953	7.293	-517.000
1.0	12.69	12.822	21.502	11.060
1.5	26.98	22.982	36.002	23.132
2.0	9.52	33.403	50.754	35.649
2.5	11.11	44.056	65.753	48.560
3.0	6.34	54.912	80.953	61.816
5.0	17.46	99.763	143.165	117.276
10.0	6.34	211.530	298.335	255.401
15.0	1.58	299.083	429.290	352.576
20.0	3.17	332795.000	506.405	358.551
22.0	0.00	324.569	515.540	324.149
Average profit ¹	-	111.945	163.850	126.350
Optimal yield (ton)	-	19.98	22.420	17.840

¹ Calculation of the average did not include the case of producing 22 tons

knowledge regarding appropriate apiary management second, milpa agriculture involves little or no contamination by agricultural chemicals, third, natural vegetation is conserved in 35% (20,000 km²) of Campeche's territory and fourth, SAGARPA has implemented of a set of regulations guiding food safety, production, bottling and marketing of honey. One example is the program for monitoring and control of toxic residues in honey based on principles delineated in the System of Analysis of Dangers and Critical Points of Control (HACCP) (FAO and WHO, 2001).

Despite these advantages of beekeeping in Campeche, public policy which generally foments intensive agriculture threatens beekeeping. For example, in 2012, SAGARPA authorized commercial planting of genetically modified soy by the Monsanto Corporation in Mexico's principal honey producing states. This was met with protests by beekeeping organizations and environmental groups, resulting in a legal ruling which temporarily cancelled SAGARPA'S authorization. Had planting of genetically modified soy not been detained, Mexico probably would have lost its access by European Union (2002) honey market, given that existing EU regulations admit only 0.9% pollen from Genetically Modified (GM) plants in conventional honey and no GM pollen in organic honey. However, the threat of planting GM crops in Campeche maize as well as soy is latent.

Honey marketing and profitability

Conventional honey: Conventional honey produced by small-scale farmers is destined principally for export, though a small percentage is marketed nationally. For conventional honey for export, average annual profit for those 27% of beekeepers who produce ~1.5 tons each was \$23,000 Mexican pesos and \$100,000 for

those 18% who produce ~5 tons each. In order to reach such profitability levels with crop agriculture these families would have to produce an estimated 38 and 166 tons of maize, respectively but in 2012 they produced an average of only 13 tons. Thus, beekeeping is much more profitable than growing basic grains such as maize.

An estimated 90% of all honey from Campeche is produced conventionally. This honey is exported for two reasons. First, per capita honey consumption in Mexico is lower than in North America and Europe from 2000 to 2009, Mexican consumption was only 280 g per capita annually while in the United Kingdom per capita consumption was 540 g in the United States 580 g in Spain 790 g and in Germany 1000 g (FAOSTAT, 2013). Second, there is a significant demand for Yucatan Peninsula honey in European nations, principally in Germany and the United Kingdom due to its high quality (SADC, 2008).

The European market is accessed through large cooperatives and private businesses that take advantage of economies of scale given that they manage large volumes of honey. For this reason, ~45% of beekeepers in Campeche are organized in two large cooperatives. The Society for social Solidarity Honey and Wax of Campeche (MYC according to its Spanish initials) with 3,000 members and the Society of Rural Production Beekeepers of Champoton (AP) with 1,300 members. These cooperatives export 50% of Campeche's honey.

Through these two cooperatives, the state and federal government channel subsidies to beekeepers to cover inputs, tools, construction and furnishing of collection centers and technical assistance and training. However, they are characterized by a lack of member participation in decision making, paternalistic relations with the government and corrupt leaders. The cooperative MYC was directed 24 years, until 2009 by the same president. In 2013, MYC divided into two groups and two representatives were elected per group. Since, its foundation in 1982, the cooperative AP has only had one president. Similarly, a large number of small farmer's organizations in other nations of the global South confront difficulties in constructing a democratic process, partly due to a low level of social capital that is a lack of trust, effective norms and social networks among members (Parikh *et al.*, 2007).

Conventional honey sold in the state market has an average profit per beekeeper 46% (\$163,000 Mexican pesos) greater than exported conventional honey (\$111,000 pesos) and 29% (\$163,000 pesos) greater than exported organic honey (\$126,000 pesos). The favorable statewide sale price of honey has little impact on Campeche beekeeper's income given the small volume sold statewide.

Studies have demonstrated the low level of honey consumption in the state and throughout the Yucatan Peninsula to be related to dietary habits. Therefore, the Mexican government agency which promotes agricultural marketing and development has proposed publicity efforts to increase consumption. Another option to increase profitability is marketing honey sub-products such as royal jelly, propolis and bee venom. Nevertheless, the questionnaire reveals that only those 4.8% of beekeepers who produce >15 tons have diversified into these products. This could be due to lack of knowledge of related skills, cost of additional equipment and difficulties in marketing (Echazarreta *et al.*, 1997).

Currently, even while regulations exist regarding food safety and traceability for conventional honey in Mexico this product is not subject to verification of quality and food safety in the state market due to lack of government attention to and public interest in this market. Nevertheless, the global tendency indicates that norms demanded by nations of the global North will converge with those of nations of the global South which export organic honey. This transition is related to an increase in the middle income population and the process of urbanization in these nations (Lee *et al.*, 2012).

Organic honey: Access of organic products to foreign markets is governed by a set of regulations particular to each nation. For example, access of Mexican organic honey to the European Community (EC) market is governed by the basic Regulation of Organic Products 2092/91. Another mechanism of access of organic honey to the European market is Fair Trade an alternative approach to conventional commerce aimed at transforming North-South relations by fomenting ethical consumption, empowerment of growers or producers and sale of certified products (Raynolds, 2012). Fair trade certified products involve paying the producer a minimum price and a premium for quality. Furthermore, such products should comply with two conditions: that they are grown or made by small-scale producers organized democratically and that employers should pay fair wages and guarantee the right to join unions as well as the rights to security and to health (FLO, 2013).

Compliance with legislation on organic and fair trade production is controlled by certifying agencies. In Mexico, the Mexican Certifier of Ecological Products and Processes (CERTIMEX) is accredited to grant certification of environmental product declaration. Inspection and certification by CERTIMEX covers not only production but also traceability. Another organization which certifies organic honey is the Organic Crop Improvement Association (OCIA) which recently opened an office in the state of Yucatan in order to support organic honey policies.

Some researchers hold that certification may act as a barrier to small-scale producers entering new markets due to high investment costs (Perez-Aleman, 2012; Gomez *et al.*, 2011). This case study estimated that despite the fact that organic honey is 70% more expensive than conventional honey (Guemes-Ricalde *et al.*, 2006) profits were only 11% greater than for conventional honey for export and 23% less than for conventional honey sold in the state market. Similarly, Ruben *et al.* (2009) found that fair trade offered very modest profits to growers of organic banana and coffee plantations as compared to conventional plantations in Peru and Costa Rica; however, fair trade increased capitalization and strengthened small-scale producer organizations.

In 2013 in the Yucatan Peninsula, five organizations were certified in production and marketing of organic 3 honey, all of which were small organizations. Two of these are in the state of Campeche: society of organic producers of Calakmul with 229 members and United producers Lol K'ax with 38 members. According to Rosales and Rubio one type of beekeeping organization arises through the initiative of government institutions and another through the initiative of the beekeepers themselves. Those organizations which arise through government initiative have the objective of obtaining and distributing funds to cover immediate needs of families and their apiaries. These are vertically structured, based on a paternalistic culture and lack member participation in decision making. The second type aims to obtain greater profits from beekeeping by increasing the quantity and quality of their honey, thus, obtaining better sale prices. These organizations are horizontally structured have a high level of member participation are small (10-20 members) and are socially cohesive partly because they are conformed by people who know each other frequently relatives. Furthermore, these organizations generally receive advisory and training from non-governmental organizations. Small organized groups also have greater capacity for control and traceability of honey than large groups.

In Campeche 80 beekeeper's organizations are legally registered and the large majority are small organizations but few studies have focused on them. Many studies suggest that in order to increase competitiveness and quality of the products of these small organizations which in turn translates in social benefits, it is necessary to: identify characteristics of the organization (size, composition, type, rules and sanctions) (Markelova *et al.*, 2009) identify ways of monitoring quality of honey and costs of marketing transaction (Hellin *et al.*, 2009; Narrod *et al.*, 2009) and diversify and provide value added to honey and other agricultural products (Kruijssen *et al.*, 2009).

CONCLUSION

Beekeepers of Campeche are small-scale farmers whose strategy is based on multiple economic pursuits, frequently they practice beekeeping along with other agricultural and non-agricultural activities. Profitability of beekeeping is an important part of families' economic strategies and may be increased by enhancing quality as well as through marketing.

Beekeeping in Campeche enjoys favorable conditions due to the state's diverse, abundant honey producing flora, low levels of contamination from agrochemicals and external demand for honey. Establishment of strict food safety and quality standards for honey by importing nations has not affected beekeeper's exports due to adequate beekeeper management of apiaries and a policy of control and monitoring of honey safety and quality. Nevertheless, industrialized agriculture and planting of genetically modified crops is being promoted in the region, threatening access to export markets. Thus, implementation of a policy of agricultural intensification and planting of genetically modified organisms may affect the life strategy of beekeepers and disrupt the fragile equilibrium which makes beekeeping compatible with other economic pursuits.

Beekeepers produce two types of honey which they market through three channels: conventional honey for export, sold through the Farmers-Local Middlemen-Producers' Organizations-Exporters Channel, conventional honey for the state market, sold through the Farmers-Local Retailers Channel and organic honey for export, sold through the Farmers-Exporters Channel.

Conventional honey for export produced by small-scale farmers in Campeche is profitable but continues to be controlled by large organizations which exclude their members from decision making and lack transparency in management of funds. In an effort to increase profitability, beekeepers organize in small groups to produce organic honey for export and conventional honey for the internal market. Organic honey for export is in high demand but is more costly to produce and less profitable than conventional honey sold in the state market. Nevertheless, conventional honey destined for domestic market is characterized by low per capita consumption and lack of control over quality and food safety. In order to access these markets, small producers are beginning to organize into self-managing groups based on their common interests. In recent decades, the government has supported beekeeping by providing inputs, tools, collection centers and training but it has not promoted self-managing organizations as an instrument for innovation and technological change. Therefore, the

challenge of small producers in order to increase their profitability and access to markets is to organize and strengthen self-managing groups. Those wishing to support such organizations lack knowledge regarding the composition and structure of these organizations their quality control mechanisms and costs of access to markets, diversification and value added of honey and its sub-products.

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