Essay

Strategy of producers in southern Yucatan to insert themselves into the market economy

José Antonio Ávila Dorantes

Chapingo Autonomous University-Yucatan Peninsula Regional University Center. Exhacienda Temozón Norte, S/N. Address known municipality of Mérida, Yucatán. Tel. 999 9240054.

Corresponding author: aviladorantes@hotmail.com.

Abstract

The purpose of this article is to highlight the case of producers of a community in southern Yucatan, who follow a strategy based on obtaining income within their production unit, which generally rootes them in their community. The objective is to characterize the family farming of the community of Yáaxhom, Yucatan, and analyze the behaviour of producers, through monetary income, to solve their daily economic problem. For the characterization of the community, the general method for the multilateral agriculture study was followed, while to obtain the net monetary income, the conventional economic theory of income and costs was adapted to the production units that do not behave as companies, and a statistical sample of the community was obtained. The results suggest that the integration of a nearby market, availability of natural resources, organization of producers, government support and development of polycultures, have made producers not interested in abandoning their production units. The origin of income within the production unit is diversified and flows practically all year round. The promotion by authorities of similar strategies in other regions can inhibit country-city emigration.

Keywords: conventional economy, family farming, production strategies, sources of income.

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One of the widely accepted theories over the past century was the role of agriculture in economic growth. In the early stages of growth, agriculture must transfer resources to other sectors of production, such as labour, goods-salary or capital, to support them in economic takeoff (Schultz, 1956; Rostov, 1961; Kuznets, 1968). Later, since the sixties of the last century, it was promoted in the academy (Hayek, 1994; Gordon, 1996), that countries' economic growth be based on a model of free market and trade openness, so the state would retreat and its place would be gradually occupied by private initiative. The inclination for greater trade openness led the world economy to a process of globalization.

Economic growth in much of the world followed these strategies. For example, in the United States of America, in the period 1920-1949, more than 50 million inhabitants left agriculture to engage in other activities (Schultz, 1956). In Mexico, in the last century, in the boom period of the agricultural sector, 1942-1961, transferred labor resources, through field-city emigration, and capital resources through the combined effect of the tax regime, the banking system, and the price mechanism (Reyes *et al*., 1974).

So far this century, López (2000) affirms that a quarter of the population of the country still lives in the rural sector and that for the period 1991-2003, the population dedicated to agricultural activities decreased 21% when it changed from 9.8 to 7.7 million people. Lately and at the region level, in Yucatan, there are migrations from milperos towns to development poles such as Merida and Progreso and more recently to the touristic zones of the Riviera Maya and Cancun in Quintana Roo (Fraga, 2015).

However, these strategies, which have dominated from the middle of the last century to the present day, have been unable to absorb the labour that was freed from the economy, including that of medium and small producers of agriculture. For example, in Mexico, labour participation, within gross domestic product (PIB), during the period 1995-2015, has been declining in both the commercial and non-commercial goods sectors (Zamaniego, 2017). Among the main reasons for this decline appear to be the advancement of technology, which replaces work for capital, in the process of globalization, which involves the use of state-of-the-art technology, highly skilled workers, value chains and others (Zamaniego, 2017).

Strategies need to change. The secondary sector has not been able to absorb displaced labour in agriculture and has increased the ranks of informality in the tertiary sector, with low salaries and no social security, as well as emigration mainly to the United States of America, Avila *et al*. (2008). The flow of labour from agriculture to industry and services should be inhibited and if possible, change its meaning and promote activities that stimulate employment in the field.

Farmers produce a variety of goods that they sell or consume for themselves (agricultural, livestock, forestry), they also use various products and resources from their production unit for family enjoyment (medicinal plants, ornate plants, for construction) and others such as carbon capture and the proportion of oxygen to society, which are often not counted in the income formation of these producers. This diverse production takes place in Mexico, in 76% of the

agricultural family units (UFA) and are the ones that generate the most employment, they take care of the environment, and contribute strongly to food sovereignty in Latin America and the Caribbean (Leporati *et al*., 2014; Salcedo *et al*., 2014).

From what has been said, the need to analyze the activities carried out in the field emerges, which stimulate and allow the permanence of rural producers and their descendants, and to inhibit the migratory flow between country-city. To this, it is essential to analyze strategies that UFA are carrying out in terms of their income and distribution during the year, which allow people who live in the countryside to have more alternatives when making their decisions about where to work.

Justification

From the point of view of conventional economic theory, a person who wants to enter the labour market can dedicate his available time between work and rest (Nicholson, 2005), rest includes all the activities that are developed, and for which it does not obtain income. Rural producers spend their time available working within their production unit, outside of it, or using it at rest, to the point where the marginal product value of each of them is equal (Ahearn *et al*., 2006). There are different reasons why rural producers abandon their production unit; from the economic point of view, the explanation is that the value of their expected marginal product is greater working outside than within their production unit (Nicholson, 2005).

Conventional economic theory teaches that a person's usefulness or satisfaction is represented by what spends on goods and services. This expense is less than or equal to its income, as the difference, if it exists, can be saved (since saving represents future spending) (Samuelson and Nordhaus, 2003; Romer, 2018). There is a direct relationship between income and savings.

Savings increase, if income increases and vice versa. For low-income families per head, which is one of the 9 variables considered by the National Council for the Evaluation of Social Development Policy (CONEVAL, 2018) for poverty measurement, income is often insufficient to cover consumption, so its savings can be considered negligible or zero. This means that all their income is used for consumption. Under the economical point of view, the increase in consumption means an increase in their satisfaction, so increasing their income means increasing their satisfaction.

The objective was to characterize the family farming of a community, as well as analyze the behaviour of producers, through monetary income, to solve their daily economic problem, and that allows them to stay in their production unit.

Methodology

The municipality of Oxkutzcab has an average height of 33 meters above sea level (msnm). It is 80 km from the City of Merida, Yucatan in a southeast direction. Most of the municipal territory is flat. However, it is crossed by a mountain range in an east-west direction, in which the Yáaxhom town is located, at a distance of 10 km southeast of the municipal headwater. One of the interpretations of the meaning of the word Yáaxhom is 'First hollow' (yáax, first and k'om, hollow)

(Bastarrachea y Canto, 2007). The population is around 300 inhabitants. Approximately 90% of the community has drinking water in their homes. Electricity is a relatively new service, benefiting approximately 75% of the population.

The climate in the region is warm-sub-humid, with an average annual temperature of 26.3 °C and a range of 26 °C-28 °C with rains in the months of May and June mainly. When they are interrupted, the mid-summer drought occurs, with a precipitation range of 1 000-1 100 mm. Relative humidity in march is 66% and in December it is 89%. The prevailing winds come from the southeast. Soils are fertile for agricultural use (Duch, 1988). The water depth of the wells used for irrigation is between 60 and 70 m and it is mainly cultivated citrus (lemon, 84%; orange, 67%; mandarin, 33%), avocado, 75%, corn, 33% and other crops, 58% (such as mango, cucumber, pumpkin, mamey, coconut, grape, zapote, saramuyo, soursop). Due to the habit of insert other crops such as annuals and vegetables in their fruit trees, and of sowing various fruit trees in association, producers in the town of Yaax-hom work their plots intensively.

For the characterization of the community, the methodology that includes five levels of research was frequently followed: the productive field, labor processes, production units, dominant agents, and the social sectors of the Regional University Center of the Yucatan Peninsula (CRUPY) of the Universidad Autónoma Chapingo (UACH), (Macossay, 1991).

A physical tour phase was carried out in the study area and contact was established with the municipal authority, commissary and various leading producers. Then, a field phase during 2015, with teams of CRUPY students. This phase included two stages: 1) methodological reviews and reference documents on climate, orography and socioeconomics factors; and 2) stays in the community, collecting and verifying information through questionnaire, field notebook and living and supporting the daily activities of the families.

A random sample size (12) of the 60 families from Yáaxhom was obtained by the Random Unrestricted Sampling (MIA) method (Scheaffer *et al*., 2007), to which interviews were conducted according to a modified questionnaire frequently used by CRUPY. The information was then emptied into Excell program worksheets for further analysis.

Starting from a production unit that operates as a company, net income would be calculated (Samuelson and Nordhaus, 2004): IT= PQ (1) CT= CV+CF (2), G= IT-CT. (3). In which: IT= total income; P= sale price; Q= production; CT= total cost; CV= variable cost; CF= fixed cost; G= net income (gain). For this concept to adapt to the operation of UFA (they are not looking for utilities), which are related to the market of inputs and products, either by acquiring at least some input, and selling some or all of their Q, the CV can be divided into CV1 and CV2. CV1 represents the costs disbursed by the UFA for varying production (Q). They may represent wage labor and inputs such as water, fertilizers, improvers, pesticides and others, but they represent erogations for the head of the production unit. The CV2 the same inputs, but they do not represent expenses. They may represent family labor or other input such as water or fertilizer, which have been donated by any public or private institution.

The same procedure is followed for the CF. It can be divided into CF1 and CF2. The first represent the erogations that the UFR had to do to be able to produce and whose amount is independent of the volume of production. CF2s represent the same as the previous one, only that they did not represent erogations, as they were donated by some public or private institution.

The CT of the UFR is obtained from equation (2): CT= CV1+CV2+CF1+CF2 (4), calling CT1= CV1+CF1 (5); CT2= CV2+CF2 (5a). Of course, CT1 is a function of CT2. Its value depends on the one assumed by CT2, as producers will do their best to produce with the lowest out-of-pocket costs. CT1= F(CT2); if CT2= 0; CT1= CT; if CT2= CT; CT1= 0, replacing equations (5 and 5a) in (3); G= IT–(CT1+CT2); G+CT2= IT–CT1; calling G^*=G+CT2; G^*=IT–CT1(6).

If CT1= CV1 is considered, then CF1= 0; equation (6) becomes G^*= IT-CV1. G^* represents the net income that UFR producers earn from working within it. If the G^* is divided by the number of household wages (LF) used in the production process, an estimate of the family income per wage would be obtained (WF) for the UFR for working in their production unit. Of course, the comparison of WF with market salary (W) enriches the analysis of the producer behavior between leaving or not leaving his production unit.

The net income presented in the corresponding table is expressed at 2015 market prices and ascending order according to the monetary income obtained. In obtaining net income, the prices it receives (or would receive) and those paid by the producer are considered. Not all production becomes money, as a part is used in family self-consumption; however, in this work, production that does not enter the market is quantified in value through its opportunity cost (what is not earned in the best alternative use of the resource in question).

To get an idea of the magnitude, it is estimated that around $25 587 was the salary that a person earned annually obtaining the minimum salary of 2015 ($70.10 per day). To bring these values to 2020, cumulative inflation of 20% is used, according to the national price index to the producer of the primary sector of the National Institute of Statistics, Geography and Informatics (INEGI, 2020) and a minimum salary of $123.22 according to the National Commission on Minimum Wages (CONASAMI, 2020). The sample of the population of Yáaxhom is sectioned into 12 strata.

UFA features

Productive area: Yáaxhom is located in a hollow of La Sierrita Puuc. Its soil is one of the most fertile in Yucatan, coupled with a benign temperature throughout the year, with small variations and with good rains in quantity and distribution, and availability of water for irrigation based on deep wells, the area has allowed the development of a wide variety of plants and animals.

Many benefits of the region are the result of strong support from the State, through the implementation of different productive projects (establishment of irrigation units), mainly fruit trees and the encouragement to the organization of producers for the use and conservation of irrigation infrastructure. In addition, the State has promoted, on a smaller scale, other productive projects, especially birds, for house plots.

The age of the head of family, mostly the father, of the population surveyed, is on average 52 years and they are the ones who usually work in the production unit. Families are not usually as numerous; the number of children fluctuates around 4. In relation to the level of studies of the population surveyed, it is emphasized that 50% completed primary school, 17% secondary school and 8% finished high school and reached a higher education level (bachelor's degree, engineering, etc.). However, 17% did not complete their primary studies and 8% are illiterates. In relation to the language, 92% of the producers surveyed are bilingual, speak Spanish and maya. Older people are the ones who best dominate the indigenous language and the new generations dominate it at different levels.

Contrary to other regions (Yúnez-Naude, 2001; Lozano, 2003; Gordillo, 2018), in Yáaxhom there is reduced migration of the population to other entities or abroad. 50% of the heads of families do not live in the community, but yes in the municipal head of the sons, 72% are living in the municipality, 97% live in Yucatan and 98% in the peninsula, while emigration abroad only represents 2%.

Labor processes

Currently, the plots of the producers predominate fruit trees, mainly citrus (lemon, orange and tangerine) and avocado. There is a general tendency to have different fruit trees mixed with some forest plants on the same plot (especially cedar and mahogany). In addition to the above, vegetables (tomatoes, chilli) or annual crops (maize and beans) are often sown in some clearings of the plot.

The activities that derive from the attention to the production unit (including the house plot) stimulate the presence of the producer or his substitute (family or wage earner) in it. For example, one hectare of fruit trees requires 176 wages per year, highlighting irrigation (104), harvesting (24), weeding (20), pruning (10) and herbicide application (9), while other activities require 9 wages (scratch, planting, insecticide application and fertilizer application). The producer, while monitoring the irrigation, spends his time carrying out part of the above activities.

The use of organic fertilizers (animal fertilizer), chemicals, herbicides and insecticides, is quite widespread among producers, and not that of biofertilizers and bioplaguicides, although they are known. The massive use of these inputs causes damage to the environment, even if they are not currently perceived, in addition, the handling of empty containers is not adequate, throughout the chain, starting with the producer.

Producers have fundamentally ejidal land, while private property coexists to a lesser degree. There is a market for usufruct rights to the plots, which can be for an indeterminate time. The size of the production unit is on average 4.31 hectares, with 3.54 in production; however, most of the production unit is fractional. If the cost of irrigation infrastructure and its conservation (which is often supported by the authorities) were taken into account, the value of the land market (they are mostly ejidal lands), plus the working instruments (coas, machetes, manual harvesters, hoe, axe, among others), the degree of capitalization of UFA is high.

A quarter of the families in the community are also dedicated to the attention of birds, mainly chickens, while almost a fifth raises and fattens pigs. Both activities are carried out on the plots of the houses. The chicken coops are small and simple constructions, whose material is sometimes provided by the authorities. Care and maintenance works are mainly carried out by a family member (the spouse) during the year, and they can represent up to 90 working days of 8 hour.

Forestry activities are practically not taken into account by producers, as their use is circumstantial, scarce and self-consumption. In addition to timber plants, such as mahogany and cedar, others such as jabín (*Piscidia piscipula)* and Dzidzilché (*Gymnopodium floribundum*) are used for firewood, pennyroyal mint (*Mentha pulegium*) of medicinal type.

The animal population in the region continues to be important in quantity and variety. Since the 1980s it has been mentioned that fauna, it is represented by: spider monkey (*Ateles geoffroyi*), rabbit (*Sylvilagus floridanus*), raccoon (*Procyon* sp.), deer (*Odocoileus virginianus*), iguanas (*Ctenosaurus* sp.), snakes (*Crotalus terrificus*), turtles (*Terrapene carolina yucatana*), chachalaca (*Ortalis vetula*), chivicoyo (*Colinus virginianus*) and mountain turkey (*Meleagris ocellata*) (Pérez, 1984).

Production units

Producers are organized by irrigation units (wells), each of which brings together on average more than 30 users. Its organization allows external supports (governmental or not) to come to the knowledge of all members of the unit, who, through assemblies, express their opinion and their points of view are taken into account. However, in the purchase of inputs and sale of the product, they are handled individually.

Six possible sources of monetary income were considered: the value of agricultural production, livestock, forestry, solar (agricultural and livestock) production, collection of forest resources, and handicrafts. However, the strength of this income comes from agricultural and solar production, while the other four sources are underdeveloped, or they were not identified, as in the case of handicrafts. Agricultural income is distributed throughout the year, as the harvest of the product is varied. Lemon all year round, especially in the May-September and October-April periods; avocado all year round, especially march-May and October- February, early orange September-December, late orange, November-April and mandarin, October-February. In addition to the income derived from fruit products, those from annual crops and vegetables are added.

Forestry production is under-worked and can represent an alternative to increase the income of the production unit, the sale of mahogany and cedar is virtually zero, there are several varieties of trees in the region that could be boosted for commercial purposes (Pérez, 1984), for example, chukum *(Havardia albicans*), from whose bark are extracted the tannins used in the finishes of the regional construction industry. In income that comes from a source other than the production unit, the work of the head of the family stands out and, to a lesser extent, the government support (Prospera, Seventy, and More) and family supports, no income from remittances was identified.

Dominant agents and social sectors

The dominant political and economic agents are noted through the different governmental instances in which the federal, state and municipal forms of government are structured, on the one hand and by the different market structures present in the sale and purchase products and in the markets of capitals, on the other. The producers of Yáaxhom, as in the other localities of the country, are significantly influenced by official support in health, education and others, which through different governmental instances and political parties, come to them in form of programs.

In the sale of products and purchase of inputs, producers behave as suppliers and price-taking plaintiffs, as if they were in competitive markets, and they face buyers and sellers who act in an oligopolistic way, so they allow, as sellers, that a considerable part of the added value of the products and that the final consumer pays, pass into the hands of these buyers (independent intermediaries or linked to regional and national companies), and leaves without taking advantage, as buyers, the lower prices of the inputs that can be purchased, if they organize their purchases in a massive way. The infrastructure again presents the disadvantageous functioning of the market. Producers need to innovate to adapt to this situation (Bosc, 2016), expand the functions of their organization that currently revolve around water management, and enter the other markets that make up their production chain with their association.

Income structure

Structure of the income of the production unit: This variable consists of the sum of the production values of agricultural, livestock, forestry, solar and forest harvesting products, which are developed within the production unit (Table 1). There is a variety of fruit trees, whose sale allows producers, to have income distributed during the year, according to the harvest season and also of the types of fruit trees planted. Because these trees predominate in the production units, in general average, the value of agricultural production, most of the harvested is oriented for sale (more than 95%), leaving for self-consumption less than 5%.

However, at the strata level, self-consumption can represent up to 21% in 8% of producers, although plots are trade-oriented, 33% of producers sow maize in their production units, of which 75% of them are for self-consumption, while 25% (of 33%) in addition to maize, they plant bean and pumpkin in a staggered manner. Almost all of what is sold is transported to the market of the municipal seat (Oxkutzcab).

It is notorious that only 33% of respondents report livestock activities. These are usually performed by the producer's partner and by some of the other dependents of the family. These tasks are usually carried out on the site of the house, and for those who practice it, it represents a significant cash income ($18 622) and more than 40% of what is obtained is for sale. If both livestock and agricultural activities are taken into account, these are carried out in 75% of the lots of the interviewees.

Approximately 42% of Yáaxhom families frequently use forest plants that they have grown or grown wildly (to enrich the source of their supplies and increase monetary income (Table 1), through their domestic use: trees for fuel in the home; for house ceilings; medicinal products; to scare off mosquitoes, and occasionally, timbers like cedar and mahogany.

Structure of income obtained outside the production unit

A portion of the community's producers earn money by working outside of their production units. In this way, they have one primary and one secondary activity. Sometimes, however, the situation can be reversed, and the activity outside the plot is more important than the one carried out within it. In the case of Yáaxhom, approximately 42% of heads of family work outside of their plot. They carry out diverse activities such as taxi drivers, employees in the private sector, bureaucrats, poceros, and assistants.

These results confirm what was expressed by Tomaselli (2016), who affirms that overcoming poverty does not depend solely on the capacity of households to generate income from the production unit or the community, but from all the places where people can find employment without having to leave their habitual residence. The results also enrich the analysis of this community, in its process of depeasantization, within the theory of peasant economy (Calva, 1988). Government subsidies exist; however, the reliable and periodic are: Prospera and 70 y más, the first is the most widespread. 42% of the families in the town have this type of government support.

Table 1. Structure of total net income. Pesos and participations.

Stratum	1	2	3	4	5	6	7	8	9	10	Total income (relative)	Total income ($)
1	1	0	0	0	0	0	0	0	0	0	1	13395
2	1	0	0	0	0	0	0	0	0	0	1	56588
3	0.061	0	0	0.681	0.007	0	0	0.251	0	0	1	57445
4	0.005	0	0	0.01	0.003	0	0.93	0.062	0	0	1	77386
5	0.088	0.086	0	0	0	0	0.826	0	0	0	1	116228
6	0.645	0	0	0	0	0	0	0	0	0.355	1	123915
7	0.882	0.116	0	0	0.002	0	0	0	0	0	1	125700
8	0.344	0	0	0.286	0	0	0.332	0.038	0	0	1	126675
9	0.69	0	0	0.31	0	0	0	0	0	0	1	165248
10	0.554	0	0	0.386	0.004	0	0	0.056	0	0	1	171136
11	0.781	0.151	0	0.009	0.001	0	0.059	0	0	0	1	175217
12	0.183	0.114	0	0.087	0	0	0.591	0.026	0	0	1	206764

Total net income= 1+2+3+ +9+10. 1. agricultural production value; 2. livestock production value; 3. forestry production value; 4. solar production value; 5. collection forest resources value; 6. crafts production value; 7. income of the head of household for working outside the production unit; 8. sum of State subsidies (Prospera + 70 y más); 9. remittances; 10. family supports (not remittances). Source: direct investigation.

In the formation of total net income, the value of agricultural production stands out in almost all cases. 58% of heads of households earn agricultural income from their production unit that account for more than 50% of their total net income. The percentage increases to 67% of families, if it represents 30% of the total. Another important variable is the income earned from working outside of their production unit. When this variable exists (in 42% of heads of households), in most cases it turns out to be more than 30% of the total net income.

By linking this income to the activities that they carry out within their production unit, it is found that these heads of households frequently use hired labor. The results of fieldwork and surveys suggest that some of these heads of family (25%) require hired labor in their production units, as their activity outside of them has become the main one in terms of relative net income, while the remaining 17%, what the unit produces is not enough for them, and they must complete with what it was obtained outside of it.

If the value structure of the production generated in the production unit is worked on the basis of its destination, it turns out that it is primarily focused on supplying the market and in less proportion to self-consumption. However, this variable is not negligible, since in 33% of families, self-consumption represents at least 14%, and a maximum of 32% of total net income. Table 1 shows that 75% of heads of households earn higher income in their production unit than outside their production unit.

If the total net income earned by producers is compared with that corresponding to the minimum wage of one year (2015), 8% of producers (stratum 1) do not achieve a minimum wage as a net income, in their different activities to which it is engaged. The next two strata (2 and 3) earn income between two and three minimum wages. Fourth level (8%) barely reaches three salaries. The following three strata (5, 6 and 7) represent 25% of producers earn income that fluctuates between 4 salaries. The remaining five largest strata (42%) have incomes fluctuate between five and just over eight minimum wages per year (Table 1 and 2).

With the exception of the first stratum, the daily net income (WF) obtained by the producer in his different activities in which is engaged is higher than the one that would have been obtained with average rural salary that was paid in 2015 in the area (W), assuming the producer found a job. This means, from the income point of view, that the strategy followed by Yáaxhom producers is better than the alternative of using their labour resource in a different way. If these 'salaries' are extrapolated to 2020, the results are maintained qualitatively, but quantitatively the WF deteriorates, as a consequence of a grater increase in the minimum wage (76%), in the W (25% more than 120), while producer prices increased 20% (Table 2).

Table 2. Calculation of different 'salaries' for the Yáaxhom UFA. Current pesos.

Stratum	2015				2020			
	Total income	Daily income	Minimum income	Average income	Total income	Daily income	Minimum income	Average income
1	13 395	37	0.5	0.3	16 074	44	0.4	0.3
2	56 588	155	2.2	1.3	67905.6	186	1.5	1.2
3	57 445	157	2.2	1.3	68 934	189	1.5	1.3

Stratum	2015				2020			
	Total income	Daily income	Minimum income	Average income	Total income	Daily income	Minimum income	Average income
4	77 386	212	3	1.8	92 863.2	254	2.1	1.7
5	116 228	318	4.5	2.7	139 473.6	382	3.1	2.5
6	123 915	339	4.8	2.8	148 698	407	3.3	2.7
7	125 700	344	4.9	2.9	150 840	413	3.4	2.8
8	126 675	347	5	2.9	152 010	416	3.4	2.8
9	165 248	453	6.5	3.8	198 297.6	543	4.4	3.6
10	171 136	469	6.7	3.9	205 363.2	563	4.6	3.8
11	175 217	480	6.8	4	210 260.4	576	4.7	3.8
12	206 764	566	8.1	4.7	248 116.8	680	5.5	4.5

Direct calculations based on: minimum wage April 2015 zone A: 70.10; average salary in 2015: 120; minimum wage January 2020 rest of the country: 123.22; inflation from January 2015 to December 2020: 20% (99-79) according to INPP of the primary sector; average salary in the area in 2020: 150.

Strategy based on the source of income

In order to take advantage of the economies of scale, in the 1960s, the State promoted the development of the south of the Yucatecan state, with a program called El Plan Chaac. It consisted, among other things, of planting 5 000 ha of sweet orange in seven municipalities, including Oxkutzcab (Ávila, 2015). The farmers adapted the proposed technology, resulting in one that integrated modern and traditional technology.

During El Plan Chaac, the producers planted various fruit trees and often also, annual crops, vegetables and raised various animals. The southern region of the entity was consolidated from a planned monoculture landscape, to a polyculture landscape, which had already been carried out with the individual efforts of the families of the region. This experience permeed in various communities, including Yáaxhom.

The polyculture strategy carried out by Yáaxhom's UFA allows them to earn income from various sources within their production unit and practically, throughout the year. When carrying out polycultures, their unit production costs incurred must be prorated among the product of the various activities they carry out, so the net income is higher than that which would be obtained if the monoculture had been practiced; in addition, due to self-employment, and employ the other members of the family, they do not have to pay the corresponding wages, which again increases their net income, through lower costs. On the other hand, the various agricultural, livestock and forestry activities carried out by the Yáaxhom's UFA provides employment and biodiversity, so they strongly support the fight against unemployment and environmental pollution. Carbon capture is another product of the UFA, which would increase its net income, if this environmental service was valued at market price.

Most Yáaxhom's UFA (75%) earn higher net income within their production unit than, working outside of it, so they have strong incentives to consider it as their main activity, and stay in it. The remaining 25% of the UFA, earn higher income from working outside than within the production unit, this discourages their permanence in the UFA and encourages them to leave it to other household members, to rent labor, to rent or even sell their production unit.

The UFA continue to be important in the agricultural sector. They still represent 76% of the production units in Mexico and the level of Latin America and the Caribbean: 81% of agricultural holdings provide at the country level, from 27% to 67% of total food production, occupy between 12% and 67% of the agricultural area, and generate between 57% and 77% of agricultural employment in the Region (FAO-IDB, 2007; FAO, 2012).

Conclusions

The integration of a close location and easy access to the market, availability of adequate natural resources, organization of producers in water management, frequent government supports, spirit of improvement and polyactivities in their UFA, have made Yáaxhom producers have little interest in abandoning their production units, even for those who live outside, but close to the community.

The orientation of production to the market, the diversity of fruit trees, with preponderance of some, interspersed with forest trees, annual crops or vegetables, give the productive unit a landscape that tends to agroforestry and stimulates the presence of the producer, through the requirement of various activities, predominantly irrigation.

The origin of income within the production unit is diversified and available virtually all year round; in the integration of this income, greatly influences the one that comes from the plot of the house, as an integral part of the production unit and in which the work of women stands out. In the structure of income that the producer obtains outside the production unit, it highlights the one that is derived from his salary as a worker. When the income obtained is greater than that obtained within the production unit, labor must be hired and the production unit becomes a secondary activity.

The lack of organization in the purchase of inputs and sale of the product, which is manifested in increased costs and in pulverization of the amounts offered to producers in the market (by behaving as price takers), in front of sellers and buyers with economic, logistical and information technology power (which set prices), they increase the costs they incur and depress the income they receive.

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