

Characterization under a sustainable approach of the urban agriculture production units in the Maracaibo municipality, Zulia state.

E. Ludovic¹, N. Rincón², L. Huerta³ y R. Rincón⁴

¹Departamento de Cs. Agropecuarias, IUTM.

²Departamento de Ciencias Sociales y Económicas y Postgrado de la Facultad de Agronomía, LUZ.

³Investigadora Asesora del programa de Investigación en Comunidades Agrícolas (PICA), Facultad de Agronomía, LUZ.

⁴Departamento Socio- Económico, Facultad de Ciencias Veterinarias, LUZ.

Abstract

With the aim of characterizing under a sustainable approach the urban agriculture production units (U.P), in Maracaibo municipality, its main social, economical and ecological limitations were identified through a descriptive non experimental study. An interview with 70 close questions was structures centered in the producers of Francisco E. Bustamante and Venancio Pulgar parishes. The information was analyzed applying descriptive statistics. Results show the existence of 52 urban production units identified with a population census. It was determined that these production units have a low economical profitability, socially unacceptable conditions and an inadequate handle of the natural resources. It was also observed that the agroproductive families want to stay in the area, as well as continuing working in the agriculture activity. According to the obstacles that were found in order to initiate a new development model, a low preparation level was found to construct societies that would develop. It is concluded that the producer and his family are under social, economical and ecological conditions that induce him to poverty and to the untenability of his production unit, all these conduct to the disappearance of his products, traditions and tranquility condition that make them stay in that area.

Key words: Sustainability, characterization, agriculture production units, urban areas.

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¹Authors' e-mail: margaritaludovic@ hotmail.net; norbertodejesus@ gmail.com; isneirahuerta@ cantv. net

Introduction

The food security in a population implies that it has the basic food that would allow them an active and healthy life. However, there are factors that limit these conditions; some of these factors are the development of the city compare to the agriculture production units located at the urban areas. These areas represent how close the rural and urban areas are, but the characteristics present in these are not too known (2).

The tendency of the demographic growth shows that almost 45% of the Venezuelan territory will be incorporated as urban areas (5). Maracaibo municipality is not exempted from this situation and from the 18 parishes it has, 4 of them have urban areas (1), finding there production units that have contributed to the food security, especially to the nearest communities. With the time, these have been disappearing or have been changing its agricultural activity by another one, causing a reduction of nourishing products to the population, as well as other social and ecological problems.

This situation implies the permanence of the producer and his family, and puts in danger the natural resources, disturbing the life of the

urban families. In this sense, the objectives that were established for this study are: to identify the urban agriculture production units, as well as to determine the characteristics and main social, economical and ecological limitations in these units.

The theoretical support of this study is based on the principles proposed by Ramírez (14) about the essential dimensions that affect sustainability which are: economical, social and ecological, and those established by Zoido *et al.* (22) about the conceptualization of the urban spaces:

a) Exploitation influenced by the city.

b) Located in areas near the city.

c) Characterized by the combination of elements of the rural environment and other elements generated by the urban areas (urbanizations, industrial areas, infrastructure and big equipments).

d) Juxtaposition of urban and rural characteristics in the most common sense of both terms.

e) These reach a higher extension in the proximities of communication in order to facilitate the fast movements towards the city.

The flux of oil, food and raw matter is seen in both directions.

Materials and methods

This is a descriptive research done in the field and with an ex-post-facto non experimental design. A group of existent variables that might

have an influence in the sustainability were analyzed. The research is identified as transactional or of sections, due to the decision-taking of

the elements of the population is done in a determined moment, in a specific time (7).

The research was carried out in the urban areas of Francisco E. Bustamante and Venancio Pulgar parishes, Zulia state. This parish occupies a coast territory, located at the occidental area of the Maracaibo's Lake, and with a 393 Km² surface which represents the 0.78% of the regional territory. It is politically constituted by 18 parishes, mainly being the farming activities in Francisco Eugenio Bustamante and Venancio Pulgar, for this reason, the urban spaces of these two parishes were selected as areas for this research.

The parish has a recent geological formation, with a flat relieve, its soils have generated on alluvial materials of lacustre origin, with good and excessive drainage. Superior horizons of medium texture and low fertility are also observed, with vegetal formation correspondent to the very dry tropical forest. The soil has a low profile of a primary or natural forest, because it has been eliminated for the urban expansions. There is a temperature average of 28°C, its annual mean temperature is of 500-900 m.m., with irregular and torrential distribution, the evapotranspirations exceeds rains with a dry period of five months and two rainy periods: may and October (9).

A population census was used in the selected parishes in order to determine the number of units under study. To identify them, maps done

by the Mayoralty of Maracaibo (property register division) and those done by the Investigation Institute of la Facultad de Arquitectura (L.U.Z) were used.

Other information sources were also considered, supplied by workers of the parish and of the same community. Likewise, elements of direct observation, as the volume of vegetation that somehow define the beginning of these urban spaces were also used. The agriculture units located in both sides of the adjoining areas which divide the rural from the urban in each parish were considered as population.

The technique used for the obtaining of information was the interview, and the applied instrument was a structured questionnaire with 70 items. The compiled data was organized in a matrix for their posterior descriptive statistical analysis. For the characterization, a frequency analysis with a percentage representation was used; the results of the sustainability matrix were included in the Statistical Analysis Systems (S.A.S) 6.0 version. Limitations were identified with a theoretical analysis of the results, and with the help of organization strategies as for example the cause-effect diagram.

This representation is an instrument that is used to incorporate graphically the existent relation in a specific moment between the factors and what all these generate, hence facilitating their analysis and comprehension.

Results and discussion

Identification of the urban agriculture production units

40 productive units were identified in Francisco E. Bustamante parish with an average surface of 5ha, being in these areas some production units with recreational activities that motivate the producers to alternate with others non agriculture business. In relation to Venancio Pulgar parish, 12 production units were identified with an average surface of 11 ha. These urban areas are organized with a semi-circled trace in the periphery of Maracaibo city, with an average radio of 10.5 Km. and a marked tendency of having a higher size of going in a south-north direction, as well as a lower diversification of products in their production units.

It is important to mention that when comparing these areas to those of other cities as for example research done by neighborhoods (2) in the city of Buenos Aires, it is identified that the urban spaces have different parishes. Likewise, these have a circle shape determining a distance to the center of the city. This agrees to the said by Companioni *et al.* (3), when mentioning that rural-urban farms have productive areas that generally surpass 2 ha.

Characterization of the agriculture urban production units.

The aspects that characterize the urban production units in Maracaibo municipality are in table 1.

A) Social dimension:

Presence of the person in charge / Owner.

In relation to the direct and permanent handle in the production units, a total of 62% is attended by the owner, compare to a 38% which is attended by the person in charge. Plus the fact that those attended by the person in charged are daily inspected by the owner in 81% of cases. That is, the daily life of the production units in relation to the decision-making and the solution of problems are done by the owner and his family.

Familiar group

It is found that the masculine population is of 61% surpassing the feminine one that reaches 39%; these numbers do not agree to the indicated by OCEI (12) for Zulia state (2000). The discrepancy in function of genders might be due to movements toward other places searching better jobs and educational opportunities (13). In relation to the age, was found that the highest percentage is from 3 to 25 years old, which proves a young population able to do profitability activities and therefore, more opportunities to stay in the smallholding. This characteristic agrees to the population information for Zulia state, reported by O.C.E.I (12).

Likewise, it is observed a familiar group with low educative level, only 33% finished elementary school, 31% has not studied and 23% only finished high school. The rate of illiteracy is of 22%, over the reported values by O.C.E.I for the national area (6.7 to 7.4) but very similar to the found by Pérez *et al.* (13)

Morbidity

It can be seen the presence of

Table 1. Aspects that identify the urban agriculture production units.

Characteristics	Percentage
a) Social dimension	
Permanence of the producer	62
Sex: masculine	61
Age: between 3 and 25 years	50
Educative level (producer): High and elementary school	33
Illiterate level:	22
Morbidity (flu):	83
Consumption of water (hidrolago):	89
Access to public transportation:	33
Asphalted road:	79
Native of the area:	50
Want to stay:	79
Self-sufficiency:	48
Lack of organization:	71
Visited by people of the governments:	4
b) Economical dimension:	
Income/month (producer):	Bs. 630.462,00
Expenses/month (producer):	Bs. 574.406,00
Do not diversify activities:	96
Crop of cassava:	62
Transform agriculture products:	4
Sell from the smallholding:	83
Vegetal agriculture production unit:	58
Animal agriculture production unit:	21
Mixed production unit:	21
c) Ecological dimension:	
Knowledge in environmental conservations:	40
Agro-chemical use:	52
Knowledge of organic product:	13
Use of organic products:	4
Presence of residues:	64
Use of residues:	27
Use of machinery:	50
Crop rotation:	26
Burning-off use:	54

temporal sickness, being the most common and occupying the first place the flu (83%). As chronic illnesses,

arterial hypertension was found in 67%, 17% for diabetes among others. The nearest locations of the urban

areas are favored in the assignment of resources for the health area.

Public services

Units of agriculture production use water coming from Hidrolago enterprise in 89%. Though they have this water, people have lots of difficulties due to most output of water are illegal. This generates a question and at the same time represents a competence between the different uses of this valuable liquid. Due to the aim of this aqueduct is not to supply water for irrigating or for any other agriculture activity but instead to supply water (with lots of problems) for the urban population of Maracaibo, in a long term this aspect constitutes an obstacle for the sustainability in the agriculture system, but specially an obstacle for the small producers (15).

Even though urban areas are near, producers lacked of the main and essential public services as for example the repair of drains and gas pipeline. In relation to the public transportation, it was found that only 33% of the production units have access to this service. However, 79% of the production units involved in this research has asphalted roads. It is evident that if a sustainable development is pursued it is necessary to have structure and services that would be related to the growth and welfare of a population (19).

Expectative of emigration

In relation to the origin of the farmer, 50% of the interviewed people are native from the area, contrary to the 29% which are Colombian. This might be because these two countries

are very near, better than the option of the preparation and experience that emigrants might have. Non native producers of the area express the live much better here than in their country of origin. Considering the possibility that the familiar group that live in the productive unit would move to another city, 79% said they would not. Their main reason to stay in the urban area is mainly due to: 37% lifestyle, 17% cultural aspect. Farah (6) establishes that the maintenance of traditions inside a community is a factor of welfare and sustainability of the production systems.

Self-sufficiency

On this matter 52% of families showed that products that are generated by the production units are not enough for them, therefore they complement their necessities with markets of the city. It was also observed that the producer and the urban family become in producers and consumers at the same time, which differ to what characterized the rural areas as producers and the urban as consumers. Valentino (18) mentions that the food security represents the satisfaction of a main human right, and this right must be for all persons, houses and everyone in the country. In this sense, the food security must initiates with the self-sufficiency generated by the smallholding to then reflect it in the community.

Citizen participation

It was found that 71% of producers have never belonged to any association or associative way of organization. In the affirmative ca-

ses, (28%) the neighbors association represents the most popular organization and the only opportunity of community reunion. Results showed that 96% of interviewed families have never been visited by people of the government to participate in the plans-programs of the community. Different situation to the one suggested by Cloquell (4), when he determines that strategies toward a community correspond to the objectives of the social agents and to their persistence. It seems that the political citizen participation of municipalities as for example, the local planning boards are not in these areas, hence requiring a higher effort of the political institutions.

B) Economical dimension

Monthly income

There is an average income of the owner of the smallholding of Bs. 630.462,00, this number, when comparing it to the expense estimate of the basic products normally consumed, which is of Bs. 836.125 for August 2002 according to the report given by Document and Analysis Center for Workers (cited by Hernández, 2000) shows that the familiar group can not afford the estimated articles (personal articles, households, public services, housing, education, health, clothing, and food). For the person in charge, the situation is even worst, since his monthly income is of Bs. 144.350,00. This income, when comparing it to the national minimum salary estimated in Bs. 190.080,00 for urban workers and 156.816,00 for rural workers, the official report No 5.585 of May 28,

2002, proves this income is not enough for workers.

Monthly expenses

In relation to the owners of the smallholding, their expenses are approximately of Bs. 574.406,00 monthly, different to the person in charge when observing the average cost of Bs. 114.350,00. In the case of the person in charge, the money is limited for the nourishing of his familiar group, and in relation of how expenses generated by the familiar group of the owner of the smallholding are distributed these are classified as: food, health, education, exploitation expenses, light service and clothing. Incomes of the familiar group do not allow saving some money, there is not money left to afford other recreational expenses or others. Therefore, this is a subsistence economy, unprofitable production units which are not characterized for a sustainable agriculture.

Diversification of activities

96% of the agriculture production units located in the urban spaces do not have any type of activity different to the agriculture that would allow to diversify their incomes. Isolated cases of non agriculture activities were located, organized in order of importance: rent of the smallholding, country club and mechanic workshop. It is interesting the fact that 58% of producers do not want to do other activity different to the one they are doing. Maybe they are afraid of the unknown or maybe they just simply follow a tradition or agriculture vocation. Valentino (18) establishes, that there must be a

relation between the economical, ecological and social sustainability to the competitive capacity of the productive units, thus there should be recreational spaces, tourism, among others.

Diversification of products

There are agriculture, vegetal and animal products in these areas that are somehow a sustenance source for the producer and the rest around him. However, there exists the single crop farming where the animal specie is not diversified. From the most exploited agriculture vegetal product, cassava (*Manihot esculenta*, Crantz) resulted to be in the first place with 69% of the total, being the main source of income. 4% of the production units began the agriculture vegetal exploitation, as in the case of Aloe (*Aloe vera*) and eggplant (*Cucúrbita máxima*). In the agriculture animal product, it was observed the exploitation of pig grow as an income source, especially in Francisco E. Bustamante parish, and cattle grow in Venancio Pulgar parish.

In relation to the elaboration of products, a low diversification was seen. In relation to the exploitation of cattle rising, cheese is done only in 4% of the production units and none transformation of products in the agriculture vegetal production units.

Commercialization

83% of producers sell their products directly from the production units, it means, the sell is done only in one modality which is valid for the agro-tourism case if the real value were given to the products. These results show that the producer does

not assume any of the roles for commercializing, as for example: classification, packaging, storage, and transport. Small producers are limited to search endogen, realistic and less dependent solutions; therefore it seems that there were futuristic problems that do not motivate them (15).

This scenery does not correspond to the manifested by Winograd (21), when saying that sustenance can improve participating together and organized through an integration of the demand, diversifying products in quality and typifying according to the territory origin.

Production/product

The information was verbally obtained by the lack producers have of the production registers. Cassava crop (*Manihot esculenta*, Crantz) is in this moment with an average production of 30.000 kg/ha, a high yield compare to the national average of 12.000 kg/ha. Soil-weather conditions are favorable for the exploitation of established crops. It is also observed that some fruits are not used, not even for self-consumption and are not commercialized. In the agriculture animal products, those that are established are: the pig is sold when reaches an average of 50 kg, cattle for milk are in an average of 8 Lt/cow; smaller species as turkey are sold when reaches 12 kg, and ducks at 6 kg. The existent types of production units were: 58% for vegetables, 21.00% for animals and 21% for mix activities.

C) Ecological dimension

Knowledge in conservation of the environment.

The familiar group has little knowledge on the handle and use of the natural resources, 60% of producers and his familiar group do not have any type of knowledge on this matter. The information about the conservation in vegetation-soil-water reached a percentage of 24%, followed by a 24% in the residues handle of his smallholding. This context proves the mentioned by Villalpando (20) when he says that sustenance is achieved with the environmental education, design or natural order.

Use of agro-chemicals.

48% of interviewed people answered negatively, the producer said he did not need it and the rest do not use these products by the high acquisition costs. Those who use it, do it inadequately, without any technical criteria, finally elevating the production costs. If there were the resources, the tendency would be to use chemical fertilizers and pesticides without ecological rationality.

Organic products

In relation to the term of organic product, 87% of interviewed people said they did not know the meaning of the word, while of 13% only 4% use it as a compost. On this matter Monterroso (11) determines that in order to achieve sustainable crops there must be some biologic knowledge, and in this case crops and the environment will decide the actions for this.

In relation to the use of organic products, 64% of producers consider

important the residues generated from activity. In this matter, residues of the crop represent the first source (52%) as a way of using them, the application to the soil resulted to be the first option. It can be said that the fact of not knowing the term does not mean that its use is not practiced. This activity is done by 27% of producers, the rest throw or burn the residues, which might be related to the presence of frequent flu or respiratory illnesses. One of the basic foundations in the sustainability, mentioned by Verdaguer (19) is referent to the "relational" principle, where it is considered that the producer should use the residues of a determined process to be part of a raw matter or a product of the same or other process.

Conservation of the soil

It is observed the use of the machinery in 50% of cases, however, 58% is done without any technical help. The use of the crop rotation, 74% never do it and 54% do not still use the burning-off technique as a practice to clean the smallholding. The urban agriculture production units are traditionally handled; there are still the uses of practices that have spoiled the resources (land-water) as burn, and with this, the side effects at short and long term.

It is seen the inexistent of technician in the area that would help in the handle of appropriate practices for the organic agriculture. That is, it would not be easy to achieve a sustainable agriculture if there is not the generation and diffusion of technologies by people involved in this

activity (16).

Agro-biodiversity

Production units are limited to the production of vegetal or animal production, but the mixed or ideal system from the sustenance point of view including aromatic and medicinal crops and repellents are not too common, just mainly in Venancio Pulgar parish.

The agriculture animal products are characterized by an inclination toward cattle and pig products, and for the vegetal agriculture there is preference in the cassava crop. To achieve sustainability it is necessary the highest diversity of species and in a functional way this causes the normal exercise of the ecosystem and of the biosphere. In order to achieve the sustainable development with special emphasis in the sustainability, it is necessary to keep the biodiversity and the complexity of the ecological system, as well as is mentioned by Farah (6).

Identification of the social, economical and ecological

limitations for the sustainable handle

The use of the organization tools and management of quality, as it is the cause-effect diagram, and the description of the relational function of the subjacent causes for each component, allowed to obtain the following results:

There is scenery with people that will not reach the necessary social equity to guarantee the joy of universal rights. The production of agriculture goods does not constitute a profitable business, with attractive economical results for the different actors of the agro-alimentary system, from the producer to the consumer. Ecologically, the producer does not keep the productive capacity of the production unit. He does not preserve the natural resources and does not take advantage of them either. There is not any motivation, the rational and controlled use of the agriculture practices that are necessary for the sustainability to take the appropriate road for it (figure 1, 2 y 3)

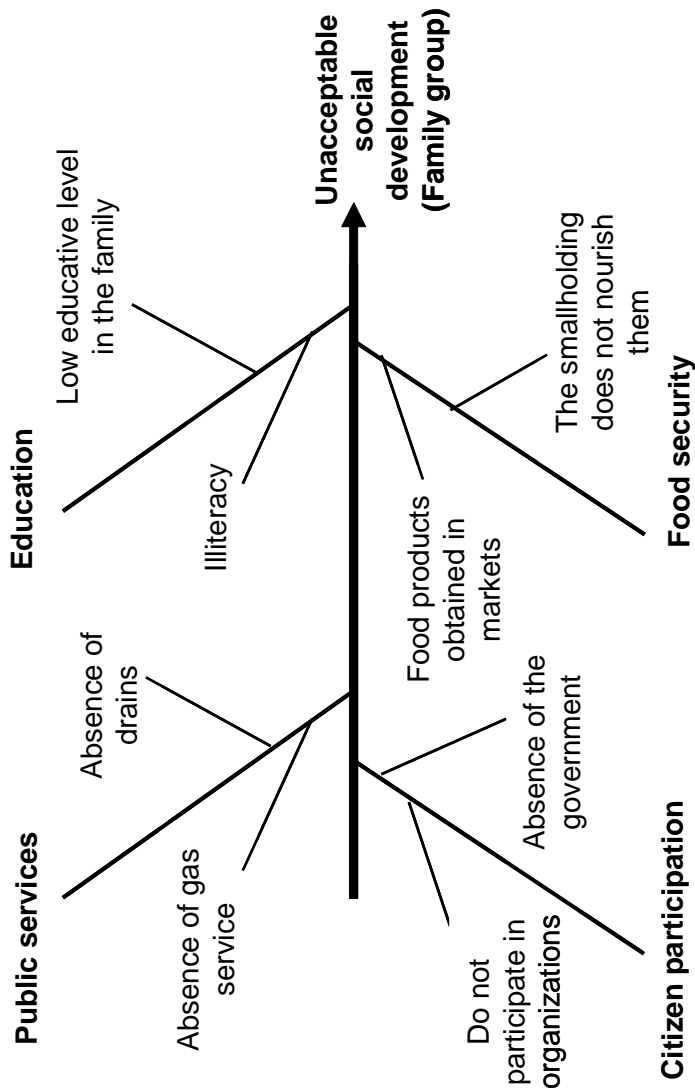


Figure 1. Cause-effect diagram for the analysis of social component

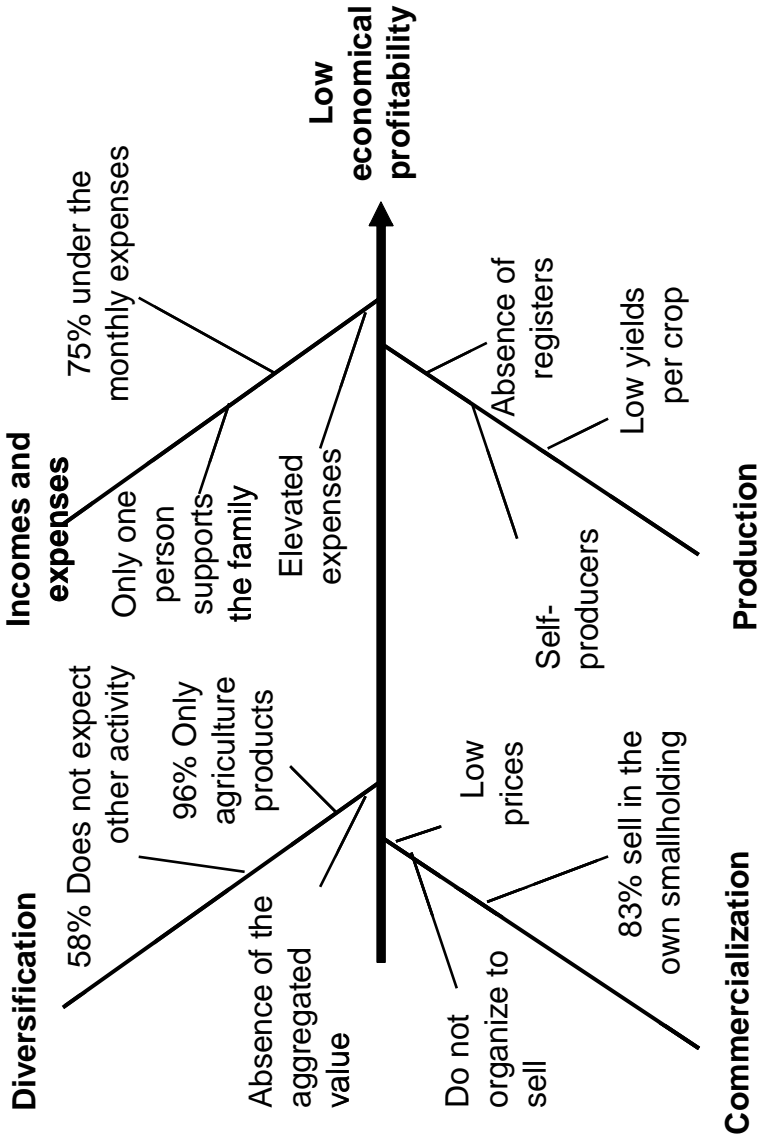


Figure 2. Cause-effect diagram for the analysis of the economical component

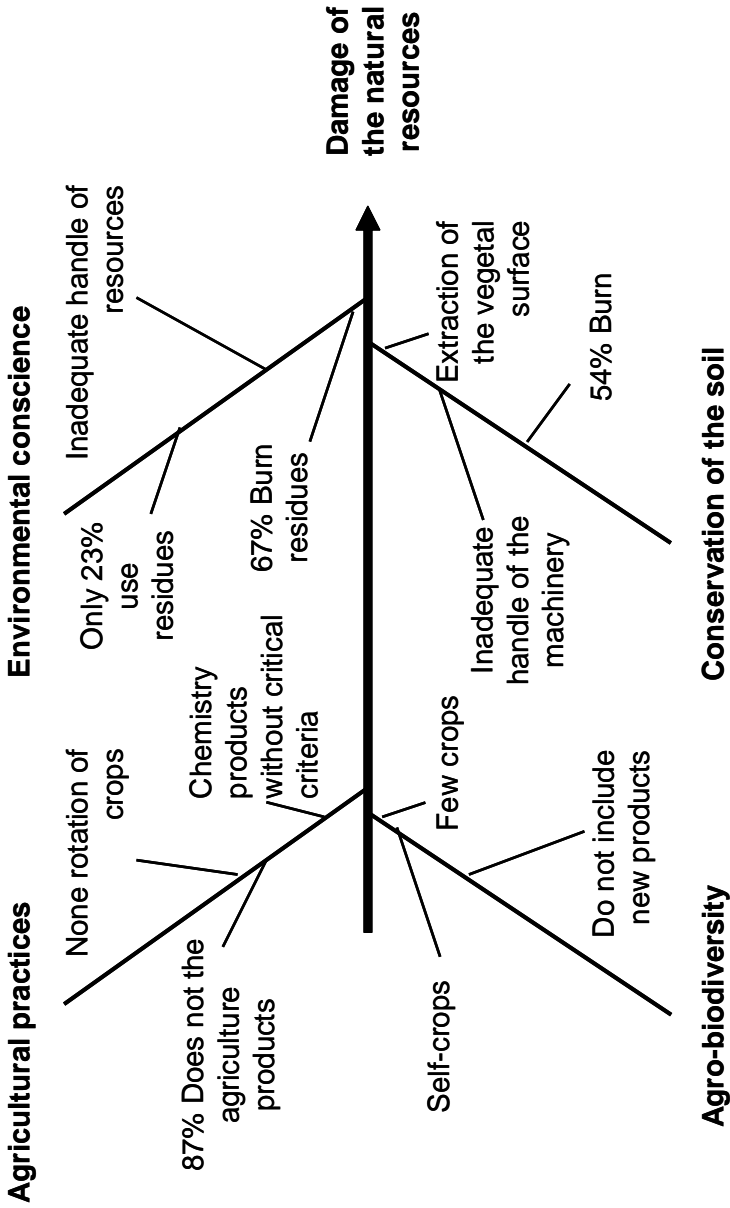


Figure 3. Cause-effect diagram for the analysis of the ecological component.

Conclusions

It was possible to identify 52 agriculture production units in the urban spaces of the studied parishes. The characterization showed that the handle of the agriculture business is shared between the owner and the person in charge, it is a young population with a high illiterate rate and regular morbidity conditions.

There is also deficient access to the public services, with a significant number of native producers of the area manifesting few possibilities to emigrate by the calm area and also by the agriculture tradition. The familiar group nourish in markets located near them. Meetings where would participate the community are not promoted, they do not gather as an organization and at the same time, there is not the presence of people from the government.

Economically speaking, incomes that producers get are very low, there is not much participation of the familiar group in the field activities and the main expense is focused in the food. The producer does not diversify his activity neither commercial products. Production units are mainly committed to the agriculture vegetal activity, and the commercialization process initiates in this.

Considering the ecological

dimension, the producer and his family have very little knowledge about the preservation of the environment. They are not assisted by a capable personnel related to the agriculture area, they have little knowledge in the term and use of the organic product, few use of residues, they do not practice the crop rotation and still use the burning-off practice to clean the area.

With the obtained results it can be concluded that the producer and his familiar group are under social, economical and ecological conditions that cause poverty conditions and the untenability of his production unit. With this, they become vulnerable to the urban process around them without any type of transition, therefore, disappearing their products, traditions, habits and tranquility that make them staying in these areas. Therefore, they are facing an unsteady nourishing security and a social unbalance.

When identifying some limitations for the sustainability, it was found that there is not any preparation of persons to construct societies that would develop and would value a new model of sustainable development.

Recommendations

It is needed, for the familiar group, an extension program that would allow in a short term to prepare the producer and his family (indi-

vidual behavior-handle of the agriculture business under a sustainable approach-handle of natural resources). Likewise, it is

recommended to measure sustenance in future investigations about the political-institutional, territorial and

technological dimensions, and in this way, to improve the results found in this research.

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