

## The small farmers and its participation in the process of agricultural commercialization.

Rincón, N.<sup>1</sup>, Segovia, E.<sup>1</sup>, Aguilera, G.<sup>2</sup>, López, A.<sup>3</sup>, Zavarce, E.<sup>3</sup> y Leal, M.<sup>4</sup>

<sup>1</sup>Universidad del Zulia. Facultad de Agronomía.

<sup>2</sup>Ing. del Programa PRODECOP Anzuátegui, Fundación CIARA

<sup>3</sup>Asistente de Investigación. Programa de Investigación en Comunidades Agrícolas. Financiado por CONDES N° 01439-00.

### Abstract

With the purpose of characterize a study was conducted in San Jose parish, Jesus Enrique Lossada county, Zulia state to small farmers and to evaluate its participation in the marketing of agricultural products, The research was descriptive – participative. It were made several observations of field, census, region sketch and workshops to obtain collective information about technical, organization and marketing requirements. It was applied a structural interview to 83,3% of population. Data were analyzed with Statistical Analysis System (SAS), It was applied the independence of variables of classification test  $X^2$ , through the use statistic proposed by Fred David in order to generate strategically solution. The results show that 76% of producers have plots between 1 and 6 hectares and the 84% only the culture of 3 hectares. The 86% sell to the intermediary and there is no a direct action on marketing, which determine a low level of participation in the process, though its relation with experience, training and hectares quantity was no significant ( $X^2$  ;  $P < 0.01$ ). Producers recognize its little organization and participation, but they do not visualize it as a opportunity to take part in the process.

**Key words:** Venezuelan small farmers, agricultural commercialization, participation, organization.

### Introduction

The agriculturists dedicate themselves to the production, because there are people in disposition to consume what they harvest. The production by itself would not have sense, without the disposition of the

medium that allow the positioning of products in the market and a demand to satisfy. It is a justice act, after all its effort, to guarantee to the producers an easy and safe access to the markets to sale their products.

---

Received 16-5-2002 ● Accepted 22-10-2003.

<sup>1</sup>Mail author email: nrincon@luz.ve; emmasegovial@cantv.net

The agricultural commercialization is a process that allows to products arrive at the consumers located in distant urban zones of the agricultural areas of operation, so what the number of operations and functions that are carried out, determine the degree of complexity of the process. In this form, it is possible to establish the commercialization is a set of processes or stages that must surpass products in the transfer flow from the producer to the final consumer. (11).

The participation of the small farmers in the commercialization of their products, is perhaps, one of the delayed, dispersed and disorganized aspects, not only of the national economy but also of Latin America. (5). The commercialization food system in Venezuela is affected, among other due to: the season of the production, the volumes of negotiation, the dispersion of the production units, the distance of the markets and the ignorance of the options to place products in hand of the consumers. On the other hand, the complexity of the distribution channels grows according to fresh products consumption or material for the industry (15). This process is important to regulate the nourishing security of any country. In Venezuela, where certain deterioration of the interchange relations is observed, instability in the capital flows; as well as a mixture of disturbances of political order that contribute to generate general and maintained rises in the prices of products (2). In order to try to impel the

improvement of all the activities that the farmer makes in their unit of production, in special in the commercialization precinct of harvested products, it is precise the adoption of alternatives related to the social, economic and managerial aspect; the farmer, their families, taking in consideration all the surroundings (7 and 9). If it an accomplish to develop actions that allow to improve, fundamentally, the participation of the small farmers in the commercialization process, would take place very important increases in their income, having diminished the rural poverty. So that, it is necessary to eliminate the unfavorable conditions; like the weak power of negotiation, the lack of control on commercialization channels, and the lack of qualification and support. (15). When it is desired to design a proposal that tends to improve the relations of interchange in the commercialization process, it is also necessary to make strategic decisions (6); where different processes from analysis are involved such as: the personal and organizational and marketing aspect of goods, in addition to the surroundings where the agricultural activities and the commercialization in San José parish are developed. It is not necessary to develop a very deep study to know that the farmers need some technological strategies that help to solve them the problems that affects when commercializing their products (5). Additionally if it considered an approach of system to promote a sustainable development

and nourishing security, since these producers supply of perishable agricultural products for the satisfaction of the nutritional requirements of the consumers in Maracaibo County. «San José « parish of the Jesus Enrique Lossada County, has a population of 3,404 of habitants and a 132 surface of Km<sup>2</sup>, populated by little and medium farmers that dedicate themselves to the vegetal production, like fruit trees (guava, medlar-tree, handle, soursop, papaya among others), vegetables (green onion, coriander), and tubercles (cassava), in addition to animal production (bovine, ovine and goat).

(13 and 17). Considering that this parish is not exempt of the factors that affect the agricultural process of agricultural marketing, it is necessary to do an investigation to characterize the process of commercialization of agricultural products and to evaluate the intervention of the small farmers in the same, moreover to generate proposals with the objective to improve the life conditions of the farmer and their families, through a greater participation in the process of marketing or commercialization of the harvested product, as much in individual form as communitarian.

## **Materials and methods**

### **Type and design research**

Methods pertaining to the participative research like the direct observation, fast diagnosis, workshops, graphical visualization and the triangulation were applied. According to Geilfus (8) these tools as much provide qualitative information as quantitative in reliable and proved form; at the same time that the triangulation allows the verification of methods and results. Also it is defined as descriptive, since the aspects were identified and described that characterize the process of agricultural products commercialization. The factors of this system that determine the characteristics were interpreted and analyzed, for explaining the existing situations in the different activities from the small farmers in their units of production, as well as their participation in the

marketing process (18). The design was the cross-sectional or transectional descriptive, which has as a purpose to find out the incidence and the values in which it is pronounced one or more variables, measures in an opportunity (10).

### **Description of the zone of study**

The study area includes the San José parish, Jesus Enrique Lossada County of Zulia state, whose limits are the following: to the East Maracaibo County, to the West Jose Ramon Yépez Parish, to the North with the Mara County and to the South with La Concepción Parish (17). From the four parishes that conform this County, San José is the greater vegetal agricultural vocation and by its location, it constitutes a food source for the supplying of Maracaibo County. The study area presents soils

with sandy textures in the superficial layers, classifying itself like Haplargids (4), with average texture, moderately drained, with low concentrations of organic matter and pH around 4,5 – 5,5. It have a relief from 0 to 200 msnm, and a vegetation classified like very dry tropical forest, Holdridge (4). The natural vegetation in the zone very has been taken part, since it has replaced by fruit orchards under irrigation and horticulture farms, in associations of grass established for the grazing. Precipitations from 500 mm to 1500 annual mm, distributed in bimodal form, with two maximums tips (April–July and September–November), and two minimums (January– February and August –July). The evaporation is 1800 to 2500 mm annual, these high evaporations must be due to the high temperatures (28 °C to 30 °C).

### **Population and Sample**

In order to determine the population and due to the absence reliable and effective official registries, it was necessary to raise a census with the totality of the farmers of the Parish. For this a series of consecutive visits was made, which in addition allowed to delimit the study area. This information was drained and shaped in a sketch, thus obtaining, to locate each one of the production units and to know its in charge owners and/or people in charge. In this first step it was managed to obtain the total population of active farmers within the parish in study. The total was of 114 units of agricultural production. For the selection of the sample the

following criteria settled down:

- Main activity: Vegetal agriculturist.
- Established time of: more than a year.
- Surface: between 1 and 20 hectares.

Being a sample conformed by 95 units of production (83.33 % of the total), distributed in 7 sectors, identified like: Santa Rosa, San Benito, Marimonda 2, Los Lirios, El Cuchuchero, Chivato and 4 Vías.

Techniques and instruments of data collection

In order to collect the field information a questionnaire structured with closed and opened questions was designed, being based on the characteristics observed in the first made visits the field (inspection visits). 7 variables and 143 items were structured. A questionnaire was applied using the technique of the direct interview. Once tabulated and codified the information the Statistical Analysis System was used for the analysis (16), obtaining the frequencies and their distribution in quartiles (Q1 and Q3) for the values of top, average and backward. In order to evaluate the existing relation between the level of participation in the process of commercialization and the other variables considered in this research such as: years of experience, level of training, size of the parcel, seeded surface, type of goods and modality of sale, among others, the test of hypothesis of independence of variables of classification by means of the use of the  $X^2$  was made (20).

Strategic Situational Analysis

## FOWT

The strategic situation was made following the procedure proposed by David (6), analyzing the internal average where the forces or strengths were determined, considering the restrictions or weaknesses; and an analysis of the key factors of the surroundings to establish the opportunities and threats. Then to generate the proposal

strategic it designed the FOWT matrix. The characteristics of the internal and the surroundings environment were listed, and they were confronted in the superior part placing the internal capacity to commercialize, it means the fortress (F) and weaknesses (W), and in vertical form the opportunities were listed (O), and also the threats (T).

## Results and discussion

### 1. - Characterization:

**The farmer:** The results of the interviews are summarized in the table 1, showing that 81% of the farmers are of masculine sex. The age of the majority (52%) oscillates between 32 and 53 years, showing a force of young work and 74% have more than five years of experience in the agricultural activity. The educative level was low, since 55% reached primary studies and the rate of illiteracy was of 13%, rising the values of the regional rates and national, according to the OCEI (12) in 2000 year, were located in 6,7 and 7,4%, respectively. Although, inferior to the reported by Perez *et al.*(14), for an agricultural community of a neighboring county. 77% of the farmers live in the production unit, with a high familiar load, where 78% have the responsibility to maintain to more than 5 people in their home, which generates economic a demand constant that it requires to be satisfied. 66% of the producers show desires to keep in the agricultural activities, whereas to the rest (34%),

it would like to make other workings such as: commerce, oil workers, mechanics, among others. This demonstrates that in spite of the influence in the county of the oil company, the agricultural vocation even stays. 78% do not take any registry of the activities and negotiations that develop.

There are low level of participation in the organizations, only 15% of them belong to some type of association and 73% do not know their existence. As far as mass media to stay informed, were that although only 51% of the farmers declared to read the press of the region, 80% listens to radio programs (musical and news), being the transmitters more tuned Mara Ritmo 900 and Zuliana 106.

**b. Unity of production:** As it is shown in table 1, 76% of the zone of the production units or blocks have among 1 and 6 hectares. Nevertheless, it is well known the small surface available for the agricultural production, maintains a great part of an idle surface, since 84%

**Table1. Aspects that identify to small farmers and their production units.**

Characteristics	Percentage
a. – Farmers:	
Sex: Masculine	81
Age between 32 to 53	52
Experience between 5 and 20 years	74
Educative level: primary	55
Level of illiteracy	13
Place of residence: the production unit	77
Desire to keep in the agricultural activity	66
They do not have land registries	78
Association: Agricultural Syndicate, Council	15
Communication media	
Radio	80
Press	51
b. – Production Unities:	
Size (Surface in Has)	
1 to 6	76
> 6	24
Cultivated surface (Has)	
< 1 – 3	84
> 3	16
Limitation to seed all the surface	
Lack of water and money	53
Surface cultivated with irrigation (Has)	
< 1 - 2.45	75
2,5 - 8	25
Cultivated goods	
Fruit trees	46
Tubercles	32
Vegetables	22

cultivate 3 hectares at the most. These results agree with others found in other counties of Zulia state (1.14 and 19); in spite of disposing with farmers with vocation, and soils with excellent physical-chemistries characteristics, making a bad use the main part of the surface for

production. There are multiple reasons, but 53% of the farmers of San José, argues that the main problem to seed all the block is the limited availability of resources and financial support, combined to the water problem; even when they have it, due to the Tulé aqueduct that spurts of

water to Maracaibo county, they present many difficulties because of the illegal taps and constantly they are put under cuts of the service, which generates a great uncertainty. In spite of this reason, all the farmers (100%) use the originating water of this aqueduct to irrigate their cultures and 75% of them irrigate annually between 1 and 2.5 has.

## **2. The commercialization process:**

As it is observed in table 2, 57% of the producers limit their participation in the process of commercialization the product to interchange with the intermediary (truck driver), whereas 15% have greater participation in the distribution, commercializing themselves its products with no need of intermediaries to the wholesale market. In addition 42% to the farmers declared to receive the payment immediately, at the time of giving their merchandise (on cash), whereas 38% do one or two weeks after the delivery (on credit), 20% rest leave it to consignment.

When comparing the variable level of participation, a statistically significant relation with other variables does not exist such as: years of experience as a farmer, level of instruction, size of the parcel, cultivated surface, nor with the type of good in production. Nevertheless, it was significant for other variables such as: lack of financial liquidity, the problematic situation of the water supply; the price information, like with the mode of payment when selling their products. This explains

because the farmers that less participate in the commercialization process, are indeed that explain to have problems of financing and water, those that do not handle information of prices and those that sell their products on credit and/or to consignment. Putting them under the propose exigencies by the intermediaries, as much in the price as in the other factors related to the market, taking them to disadvantageous situations at the time of making the negotiation.

These results also demonstrate that disposing on: experience, a great amount of land, opportunity to cultivate, are not enough elements to decide to take part in the commercialization process. It seemed then, that the problems that the farmer presents turn into true limitations to obtain their effective participation in the process of rural development. This agrees with the results obtained by Borges *et al.* (1) and by Urdaneta *et al.* (19) where they indicate that the little farmers do not reach the development and stay in the poverty; not by an economic problem, but by a problem of vision that unmotivated and limits to look for them endogenous solutions, realistic and less dependent. An aspect to indicate is that a 57% of the farmers attribute the responsibility of their problems to the low prices that receive by their products and just a 16% consider that is due to the speculation on the part of the intermediaries. On the other hand, a 58% visualize as a solution that someone or something, eliminates the intermediaries,

**Table 2. Level of participation of the small farmers in the process of commercialization and its characteristics.**

Characteristics	Percentage
Commercialization:	
Level of participation (according to they sell)	
Directly to the markets	15
Truck drivers	57
Truck drivers and some times to the market	28
Type of sales	
Cash	42
Credit	38
Consignment	20
Relationship: Level of Participation &.....	(X <sup>2</sup> )
Years of Experience	N. S.
Level of instruction	N. S.
Problem Type	S.
Surface of the parcel	N. S.
Cultivated surface	N. S.
Type of goods	N. S.
Information of prices	S.
Type of sale	S.
Information of prices	
Look for in the market	26
Problems	
Low prices	57
Intermediaries	16
None	17
Propose solutions	
To eliminate intermediary	58
To create market where to sell its products	28
To increase prices	14

because in individual form they are not able to create or to visualize alternatives different from the promoted by the paternalism. Borges *et al.*(1), exposes that this conduct type reflects the low level of confidence and the little communitarian participation. Others (28%) see as an alternative to make

the creation of a market in the zone to be able to sell their products. As far as the prices information, a 26% manifest that they obtain it investigating by themselves in the market or asking between their neighbors before making the negotiation. The farmers recognize that they are not organized nor

participate in the associations placed in the parish, but in no case they visualize it like as an opportunity that allows them to find solutions to the problems to manage to improve the income, obtaining a greater remuneration by products. This evidence a clear individualistic conduct that nothing has to do with the financial resources, nor with the amount of land that they have. Before this situation it is recommended that between the proposals to improve the participation of the farmers in the commercialization process, to manage to the incomes of the sales and to place directly commerce volumes until the wholesalers; the organization or association, who would allow them, in spite of the cultivated surface, to face the problems by them identified.

### **3. The situational analysis for the elaboration of strategic proposals.**

In table 3 the different types of strategies are observed that were from the matrix of the situational analysis. These proposals are based on two basic aspects: qualification for the organization and the production and necessity of an information market system.

**a. Program of qualification:** directed to grant knowledge on the rational use of the resource water; service of commercialization; elevation of the technological level; administrative control of its units of production. To equip them with knowledge of rural communication by which the small farmers stay informed into the present prices to place them favorable position at the

moment of commercializing the agricultural goods.

**b. Promote the organization of producers:** with the purpose of obtaining a greater participation in the commercialization process is due to fortify the associations that exist in the zone, promoting them and/or motivating the constitution of new organizations for the commercialization and so the farmers are more efficient when they take part in the marketing process. The organization modality could be based on the type of good to harvest, because each farmer maintains his autonomy in the time and the price that receive by his goods, taking in consideration that 86% of the surveyed farmers expressed to be arranged to comprise of associations to improve the technical level, and that as well allows them to benefit in the purchases from goods and sales from harvests. Therefore the creation of an organization sets out who has a good administrative platform and that based on values and communitarian principles. With these strategic proposals of organization it is tried to obtain that the small farmers are able to: acquire the goods at wholesale way, saving in the purchase and the costs of transport, that influence in the operational expenses. Reduction of the marketing chain of its products, selling not to the first link or truck driver, but directly to the Wholesale Market, to obtain a greater margin of gain to the farmer, which can diminish the sale price to the consumer.

**Table 3. Matrix FOWM to obtain the strategic proposals**

<p style="text-align: center;">Internal Analysis</p> <p style="text-align: center;">External Analysis</p>	<p>Fortress (F)</p> <ul style="list-style-type: none"> <li>✓ Young farmers.</li> <li>✓ Agricultural experience.</li> <li>✓ Permanence.</li> <li>✓ High agricultural vocation.</li> <li>✓ Good routes of access.</li> <li>✓ Desire to be associated.</li> <li>✓ Self-knowledge of its little organization and participation.</li> </ul>	<p>Weaknesses (W)</p> <ul style="list-style-type: none"> <li>✓ Educative level.</li> <li>✓ Degree of association.</li> <li>✓ Capital of work.</li> <li>✓ Little own vehicle.</li> <li>✓ Informative level.</li> <li>✓ They do not take countable registries.</li> <li>✓ Control of price.</li> <li>✓ Little technology.</li> </ul>
<p>Opportunities (O)</p> <ul style="list-style-type: none"> <li>✓ Proximity of Maracaibo.</li> <li>✓ Wholesale market.</li> <li>✓ Agricultural Institute</li> <li>✓ Financing.</li> <li>✓ Program of extension on the part of the Mayorship</li> <li>✓ L.U.Z (technology).</li> </ul>	<p>Strategies (S)</p> <ul style="list-style-type: none"> <li>✓ To foment the organization of farmers.</li> <li>✓ To motivate the creation of committees for promotion of associations the commercialization of products.</li> </ul>	<p>Strategies (S)</p> <ul style="list-style-type: none"> <li>✓ To create an information system of market readily accessible, that it allows to plan the production.</li> </ul>
<p>Threats (T)</p> <ul style="list-style-type: none"> <li>✓ Irregularity of the service of water.</li> <li>✓ Inflation.</li> <li>✓ Low availability of credit.</li> <li>✓ Demographic pressure.</li> <li>✓ Lost of rural identity</li> </ul>	<p>Strategies (FA).</p> <ul style="list-style-type: none"> <li>✓ To create a program of qualification for the rational use of the water.</li> </ul>	<p>Strategies (DA).</p> <ul style="list-style-type: none"> <li>✓ To create qualification program so that the farmers improve their managerial capacity.</li> </ul>

## Conclusions and recommendations

It was determined that the small farmers established in the San José parish, Jesus Enrique Lossada county,

present great limitations to participate in the process of commercialization of agricultural products, represented by

horticulture crops, highly perishable and that need a great efficiency in the handling of their system to diminish the losses and maintaining the income. Among the aspects that characterize to farmers it can indicate that 81% are of masculine sex, they are relatively young, active and tend to changes; a 52% into ages between 32 and 53 years old. Traditional in the activity; from 5 to 20 years of experience 74%. A low level of scholarship that does not exceed the primary or basic education (55%) and a level of 13% of illiteracy, which is greater 4% to the national value (13). These values represent certain limitations in the development of human capacities of the farmers and for the total and exact advantage of the opportunities of the surroundings.

78% of the farmers do not take land registries of their activity and 85% of them are not organized nor are affiliated with some type of association reflecting a clear individualistic conduct, which is not related to the availability of financial resources nor to the amount of cultivated land. It was demonstrated that 76% of the studied units of production in the zone have a surface between 1 to 6 hectares, where 85% of them only cultivate 3 hectares. Attributing the low index of use of land to the difficulty that presents the water and the lack of financial resources. A low diversity exists in spite of having on an excellent access to roads and being quite near to popular markets such as Las Pulgas, La Limpia and also Mercamara, which is the main agricultural food distributors for Maracaibo county. 58% of the farmers identified the low prices as the main

problem, 16% of the dependency with the intermediaries (truck driver) and the rest considers that they do not have problems or they are not in capacity to identify them, due to this they propose as a solution the elimination of the intermediary, to create markets to place products (28%), to diminish the prices and the rest did not raise solutions. It was observed in the process of commercialization of harvested products, a high degree of dependency with the truck driver (intermediary), which determines a low participation of farmers. According to the results, it is possible to deduce that the participation or not of the farmers in the commercialization process, is associate with managemental and motivational variables type, that in order counts as much do not depend on external factors as political and laws, but of programs that fortify the technological and human capacities. A proposal strategic based on three basic aspects it is recommended such as: Qualification, Organization and Information. To create programs that include workshops of motivation and qualification that directed to distribute knowledge on agricultural marketing; rational use of the water; to elevate the technical level to improve its production and quality on service; administrative control, as well as the constitution of organizations for the collective work. To promote generation of rural communication programs by means of small farmers stay informed into the current prices in which the agricultural goods are commercialized.

## Literature cited

1. Borges, E., N. Rincón y F. Urdaneta. 2003. Visión de la calidad de vida de los habitantes de la comunidad La Estrella, municipio La Cañada de Urdaneta del estado Zulia. Rev. Fac. Agron. (LUZ). 20: 238-252.
2. Borgucci, E., J. Fuenmayor, C. Añez y M. Vargas. 1999. La ley de desarrollo agrícola y seguridad alimentaria en Venezuela: Un dilema entre el paternalismo y la apertura económica. Revista de la Facultad de Agronomía (LUZ) 16:6. pag. 708-723.
3. COPLANARH. 1975. Inventario Nacional de Tierras. Región Lago de Maracaibo. Atlas. MAC - CENIAP. Caracas. Pág. 42.
4. Ewel, J., A. Madriz y J. Tosi. 1978. Zonas de Vida de Venezuela. MAC - FONAIAP. 2<sup>da</sup> edición, Caracas. Pág. 266.
5. FAO. Oficina regional para Latinoamérica y el caribe. 1997. Guía de comercialización. N° 12. Pág. 86.
6. Fred, R. D. 1997. Conceptos de Administración Estratégica. 5ta Edición, Editorial McGraw Hill. 382 Pp.
7. Guerra, G. 1998. Manual de administración de empresas agropecuarias. 3da Edición. Instituto Interamericano de cooperación para la agricultura. San José, Costa Rica. Pág. 25 - 250.
8. Geilfus, F. 1998. 80 Herramientas para el Desarrollo Participativo. Instituto Interamericano de Cooperación para la Agricultura (IICA) - GTZ, El Salvador.
9. Haag, H 1996. El mercadeo de los productos agropecuarios. Arcos de Belén, México. Editorial Limusa Wiley S.A. Pág. 30 - 47.
10. Hernández, R., C. Fernández y P. Baptista. 2.000. Metodología de la investigación. 2° Reimpresión. Editorial McGraw Hill, Mexico. 501 pp.
11. Mendoza, G. 2.002. Diagnóstico del mercadeo agrícola y agroindustrial en Colombia: una estrategia para la reactivación de la agricultura. 2° Edición Fundación Universidad de Bogotá Jorge Tadeo Lozano. Santa Fe de Bogotá. Colombia. 208 pp.
12. Oficina Central de Estadística e Informática (OCEI). 2.000. Anuario estadístico de Venezuela. 1999. Caracas. Venezuela. Pp. 1420.
13. Oficina Central de Estadística e Informática (OCEI). 2.001. Programa de las naciones unidas para el desarrollo (PNUD). Informe sobre Desarrollo Humano en Venezuela, 2.000. Caminos para superar la pobreza.
14. Pérez, J., N. Rincón, I. Huerta y F. Urdaneta. 2.001. Diagnóstico socioeconómico de la comunidad agrícola La Estrella, estado Zulia. Revista de Ciencias Sociales (RCS) FACES - LUZ, Vol. VII, N° 1, pp23-33.
15. Segovia, E., y E. Martínez. 1998. Caracterización del comercio detallista tradicional polivalente de alimentos del municipio Maracaibo, estado Zulia, Venezuela. Rev. Fac. Agrom. (LUZ). 15:4 pp. 368-385.
16. Statistical Analysis System. 1996. USE 'S Guide: Statistics. North Carolina: SAS institute INC. Pig 585.
17. Strauss, G., W. Fuenmayor y J. Romero. 1992. Atlas del Municipio Jesús Enrique Lossada. «Facultad de humanidades y educación» (LUZ). Mapoteca Agustín Codazzi. Pig 16.
18. Salkind, N. 1.999. Métodos de Investigación 3° Ed. Pretince Hall. México. 400 pp.

19. Urdaneta, F., N. Rincón y E. Borges. 2001. La pobreza rural... un problema de visión. Rev. AGROTÉCNICO 13. División de Extensión Agrícola. Facultad de Agronomía. (LUZ).
20. Walpole, R. y R. Myers. 1.996. Probabilidad y estadística para ingenieros. 5ª edición. Editorial Nueva Editorial Interamericana, S.A. México 733 pp.