



SEED SECURITY DIAGNOSIS. PART I. ANALYSIS OF AGRICULTURAL SYSTEMS IN MUNICIPALITIES IN CUBA

Diagnóstico de Seguridad de Semillas. Parte I. Análisis de los sistemas agrícolas en municipios de Cuba

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ABSTRACT. The work was developed in agricultural cooperatives linked to the Program of Agricultural Local Innovation (PIAL according its acronyms in Spanish) in Bahía Honda, Manicaragua and Gibara municipalities, located respectively in the occident, center and east of Cuba. The study is part of the Component 1 analysis of the Methodological Guide for the Diagnose of Seed Security directed to reinforce the strategy of seed production of quality and enough quantities. The information was obtained starting from interviews to key informants, discussion in focal groups and a present survey, composed by a questionnaire of open and closed questions that was applied to a total of 96 farm chiefs. In the work they are described and compared elements of the agricultural systems: topography, agroclimatic conditions, demographic characteristics of the rural population, holding and use of the ground. The results showed that in the municipalities of the occident and center the agricultural areas are located mostly between valleys and mountains, where the main system of holding of the ground is the usufruct with prevalence of permanent cultivations, as long as in the east they are located in plane surfaces with system based mostly on the private property and the temporary cultivations prevail. Droughts, hurricanes and intense rains are climatic events that have had a significant impact in these agroecosystems during the years of study. They are evidenced in the agricultural population the symptoms of populational aging detected in Cuba and a low proportion of women farm chiefs. Keeping in mind the results it concludes that the analysis of these elements offers outstanding information of utility in the design, management and implementation of actions to achieve the security of local seed.

RESUMEN. El trabajo se desarrolló en cooperativas agrícolas vinculadas al Programa de Innovación Agrícola Local (PIAL) en los municipios Bahía Honda, Manicaragua y Gibara, ubicados en el occidente, centro y oriente de Cuba respectivamente. El estudio forma parte del análisis del Componente 1 de la Guía Metodológica para el Diagnóstico de Seguridad de Semillas dirigido a reforzar la estrategia de producción de semillas de calidad y cantidades suficientes. La información fue obtenida a partir de entrevistas a informantes clave, discusión en grupos focales y una encuesta presencial, compuesta por un cuestionario de preguntas abiertas y cerradas que se aplicó a un total de 96 jefes de fincas. En el trabajo se describen y comparan elementos de los sistemas agrícolas: topografía, condiciones agroclimáticas, características demográfica de la población rural, tenencia y uso de la tierra. Los resultados mostraron que en los municipios del occidente y centro las áreas agrícolas se localizan mayormente entre valles y montañas, donde el principal sistema de tenencia de la tierra es el usufructo con predominio de los cultivos permanentes, en tanto en el oriente se ubican en superficies llanas con sistema basado mayormente en la propiedad privada y prevalecen los cultivos temporales. Las sequías, huracanes e intensas lluvias son los eventos climáticos que han tenido un impacto significativo en estos agroecosistemas durante los años de estudio. Se evidencian en la población agrícola los síntomas de envejecimiento poblacional detectados en Cuba y una baja proporción de mujeres jefas de finca. Teniendo en cuenta los resultados se concluye que el análisis de estos elementos ofrece información relevante de utilidad en el diseño, gestión e implementación de acciones para lograr la seguridad de semilla local.

Words key: demography, interviews, gender, topography

Palabras clave: demografía, encuesta, género, topografía

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INTRODUCTION

In the food strategy of any country, seeds are an important element; however, its production has become a private and lucrative business that mainly affects the underdeveloped countries (1),

while the developed countries concentrate and dominate the production and sales of seeds with high genetic quality.

Globally, it is estimated that less than fifty large transnational corporations have the majority control of seed production (2). Only Monsanto, of the United States, controls the largest volume of sales in the world and the fifth of the market of the herbage seeds. In addition, leads the monopoly of transgenic seeds, which has been the object of strong criticism and bioethical reflections (3).

Statistics show that international seed sales are around \$ 5 billion and the global market is close to \$ 35 billion. Hybrid seeds are marketed with a value 1,000 times greater than traditional varieties reaching figures of 20 billion dollars in the global market^A.

In Cuba, seed production has become a strategic activity, in the current context of reordering the Cuban economy, where food security has been declared by the highest government leadership as a national priority (4) and to that end Line 188 of the Economic and Social Policy of the Party and Revolution is aimed at enhancing the production, benefit, conservation and commercialization of quality seeds.

At present there are 8 256 ha, dedicated to the production of seeds, which represent 0,12 % of the agricultural area, declared at 6,6 million hectares (5).

The seed destined to the cooperatives and business units is obtained in 147 farms and 23 specialized^C.

However, the national production does not satisfy the demand for quality seeds and in sufficient quantities, so it is necessary to encourage local production as an alternative that also allows bringing it closer to the places of consumption for which a safe system must be established of seeds.

Three indicators have been defined to assess seed safety: availability, access and quality, which are influenced and determined by the agricultural production systems and seed systems prevalent in a given locality.

To implement actions aimed at achieving these indicators it is necessary to have knowledge about the agricultural systems where it is desired to implement a secure system of seed production. Of course, the analysis of any system begins with its description.

Elements such as topography, climatic conditions, use of natural resources, access to productive and technological resources, among others, make it possible to make a diagnosis of local scenarios, in order to know the community's management of its environment and its Resources, which obviously depends on sociocultural elements that deserve to be defined and characterized as well.

Thus, the analysis of agricultural systems is the first component of the seed safety diagnosis and aims to describe agricultural production and consumption systems, shaped by agro-ecological, socio-cultural, political and economic conditions prevailing in the area.

For this reason, the present work was carried out with the objective of describing and comparing elements of agricultural systems in three municipalities of Cuba where the Diagnosis for Seed Safety was applied.

MATERIALS AND METHODS

The work was carried out during the months of March to October, 2014 in three municipalities of Cuba, linked to the Local Agricultural Innovation Program (PIAL), located in the west, center and east of the island: Bahía Honda, located in western Cuba on the north coast of Artemisa province, about 80 km west of Havana.

Manicaragua located in the central region of the country, to the south of the Villa Clara province.

Gibara located in the eastern region of Cuba, on the northern coast of the Holguín province.

The agricultural systems of farms organized in Cooperatives of Credits and Services (CCS) and Cooperatives of Agricultural Production (CPA) located in different agroecological zones (plains, valleys and mountains) of the three diagnosed municipalities were compared.

The comparison was made based on four elements: topography, agro-climatic conditions, demographic characteristics of the agricultural population and land tenure and use system.

As a research tool, a face-to-face and structured questionnaire was used with an open and closed questions questionnaire applied to the chief producers of the farms associated with the different productive forms visited. This survey made it possible to characterize record and observe elements and information related to the social, productive and economic particularities of the population with environmental development (6).

^A Peña Turruellas, Elizabeth. *Función Estatal Específica No 11, Recursos Fitogenéticos y Semillas*. [Material gráfico proyectable]. Dirección de Semillas, MINAG [2011]. 94 diapositivas.

^B Juventud Rebelde. Producción de semillas, un paso estratégico del desarrollo agrícola. [versión digital] Diario de la juventud cubana, 2015. Consultado: [18/01/16]. Disponible en: <<http://www.juventudrebelde.cu/cuba/2015-04-15/produccion-de-semillas-un-paso-estrategico-del-desarrollo-agricola/>>.

^C Shrestha, P., Stefov, Dana. Guía metodológica para el Diagnóstico de Seguridad de Semillas. 2014 [Consultado:24/03/14] Disponible en: <<http://www.usc-canada.org>>.

In addition, interviews were conducted with key informants (representatives of the agriculture spheres at the municipal level) and discussions in focus groups composed of farmers with extensive knowledge of the agroecosystem under study.

From a previous analysis in which the size of the three rural populations that demonstrated the absence of a typical values according to Grubbs' test (7) for ($P \leq 0,05$) was studied, the totals of the rural population by municipalities. In order to estimate the size of the sample, the constraints in terms of budget, human resources and the social context of peasant communities (dispersion of farms and difficulties with transportation) were taken into account, as well as the extension of the survey composed of 50 questions. From there, the largest possible sample size was determined according to available resources, which was calculated on 34 farms per municipality, while the minimum size was 22 farms per municipality (8). The sampling strategy for the survey was based on the selection of farms in a targeted manner to ensure adequate representation of the agricultural population.

The detection of atypical values among the totals of the municipal rural population was performed with the statistical package STATGRAPHICS Centurion XV (9).

RESULTS AND DISCUSSION

In total, 96 questionnaires were applied, 32 in Bahía Honda, 34 in Manicaragua and 30 in Gibara. The farmers surveyed mostly belong to Credit and Service Cooperatives because they are the ones with the largest number of farms (Table I).

It should be clarified that from the operational point of view there are no differences in the access to resources and technologies by producers associated with CCS or CPA,

Table I. Regional and municipal distribution, quantification of the studied areas

Region	Municipality	Popular councils	Productive units		
			Total	from them CCS	CPA
Western	Bahía Honda	5	7	6	1
Central	Manicaragua	6	6	5	1
Eastern	Gibara	3	5	5	0
Total		14	18	16	2

CCS: Credits and Services Cooperative (the partners are holders of property or usufruct rights over land and other agricultural assets and their families (5))

CPA: Cooperative of Agricultural Production (the partners are farmers owning or usufructuaries contributing land and agricultural goods, their families and any other peasants and non-contributing workers (5))

as both productive forms are supervised by the National Association of Small Farmers (ANAP). The difference between them lies in the equity contribution required for affiliation to the CPA, which is a condition for landowners and other agricultural goods.

TOPOGRAPHY OF FARMS AND AGRICULTURAL AREAS

The analysis of the surface configuration of the terrain, in the cases of Bahía Honda and Manicaragua, showed that the highest proportion of farms (85 and 97 % respectively) and cultivated area (85 and 70 %) are located between valleys and mountains (Table II).

As information related to this result, it is convenient to remember that seed production of species such as maize, which is part of the diet of many Latin American and Caribbean countries is carried out in the valleys (10) where there are better conditions for their cultivation with respect to mountains. However, access to the valleys is difficult, as is the case in the agricultural systems of Bahía Honda and Manicaragua, as well as the poor technical state of urban and agricultural automotive transport equipment (11) that is a challenge in these localities because the access roads (roads, paths and tracks) are affected by more or less pronounced topographic gradients.

Table II. Proportion of farms and agricultural areas, according to their topographic characteristics in the studied municipalities

Topography of terrain	Proportion of farms (%)			Proportion in area (%)		
	BH	Mn	Gb	BH	Mn	Gb
Plain	15	3	100	15	30	100
Valley	50	47	0	50	29	0
Mountain	35	50	0	35	41	0

BH: Bahia Honda, Gb: Gibara, Mn: Manicaragua

Coincidentally, in the valleys, crop diversity and soil fertility were classified by farmers on average, evidencing the effect of increased anthropic pressure on agricultural activities with a predominance of few cash crops (mainly sugar cane, beans, maize), a situation that contributes to the biodiversity loss and the reduction of fertility by the continuous cultivation of these species in these soils.

The criterion regarding the diversity of crops and soil fertility differ in mountainous agricultural areas, where the dispersal of the agricultural population is higher. In this connection, it has been reported that the dispersion of the population hinders the dynamics and interaction of people with the development process,

so conducting a survey conducted diagnostic participatory is the ideal place to build collective knowledge as a fundamental basis for identifying the challenges and opportunities of the system leading to the development and implementation of action plans aimed at solving those problems method difficult their development processes (12).

Meanwhile, in Gibara farm and agricultural areas they are located in the plain, where the crop diversity is considered high (contrary to expectations) and soil fertility between medium to low. Here the population is less scattered and access roads in better condition, so this town has a greater agricultural development, which gives this country a better chance to achieve safe production of seeds.

CLIMATIC CONDITIONS

Exploration of the chronology necessary to record climate data establishes that observations are made over a period of at least 30 years, unlike the meteorological time that is studied in lapses of up to two weeks (13). In this sense, the monthly behavior of rainfall and average temperatures (Table III) during the period 1982-2012 reflect that the driest month is March in Bahía Honda and Gibara and December in Manicaragua, while the rainiest month is June in Bahía Honda and Manicaragua and October in Gibara.

Table III. Average monthly behavior of rainfall and average temperature per municipality. Data 1982-2012 (14)

Months	Bahía Honda		Manicaragua		Gibara	
	Precp. (mm)	Mean T (°C)	Precp. (mm)	Mean T (°C)	Precp. (mm)	Mean T. (°C)
January	72	21,4	40	21,5	64	24,1
February	72	21,4	39	21,6	33	23,9
March	68	23	40	23	31	25
April	72	24,7	77	24,4	41	26,1
May	142	25,8	211	25,5	109	27,1
June	189	26,6	269	26,2	106	27,9
July	150	27	182	26,8	47	28,6
August	153	27,2	186	26,9	69	28,9
September	165	26,5	207	26,5	108	28,3
October	159	25,3	167	25,6	158	27,1
November	92	23,3	53	23,3	143	26,1
December	73	21,9	21	21,9	77	24,6

Source: Climate-data.org (Data 1982-2012)

The highest temperatures of the year are recorded in the month of August in the three municipalities and the lowest in January except in Gibara which is in February. There is greater variability in monthly precipitations.

However, according to Köppen's climatic classification (14) the climate in Bahía Honda is **Af** (tropical rainforest climate), while in Manicaragua and Gibara it is **Aw** (tropical savanna climate), which evidently demonstrates that the processes of Aridity are accentuated towards the east of the country.

In the scientific literature of the last few years, there have been very few studies that address the relationship between climate and seed production. Therefore, this issue must be analyzed with a holistic approach in order to understand the impact of climate on seed production as a whole leading to the adoption of anticipated measures (risk management strategies) that limit the vulnerability of this activity to the different extreme events of the climate.

In general, the main hazards that usually affect agricultural activities in the territories studied are: meteorological (hurricanes), hydrological (intense rains that cause floods) and climatic (droughts) (Table IV).

It is convenient to clarify that Cuba is located very close to the Tropic of Cancer, so that intense rains are not only caused by tropical systems (hurricanes) but also by winter systems from northern latitudes, which first affect western Cuba (15) and move towards the center sometimes affecting the eastern provinces.

Table IV. Natural disasters occurring in Bahía Honda, Gibara and Manicaragua municipalities in the last 10 years (2003-2015)

Year of disaster	Name and nature of the disaster		
	Bahía Honda	Manicaragua	Gibara
2003-2006	-	Drought	Drought
2008	Hurricanes Gustav and IKE	Hurricanes Gustav and IKE	Hurricane Ike
2009-2011	Drought	-	-
2012	Intense rains / floods	Hurricane Sandy	Hurricane Sandy
2013	Intense rains / floods	Intense rains / floods	-
2014	Intense rains / floods	Intense rains / floods	-
2015	Drought	Drought	Drought

For this reason, in recent years in Bahía Honda have been intense rains associated with the entry of cold fronts during the winter season that cause flooding in low areas. These rains are unusual for that time considered as the rainy season, which from the agroecological point of view is the most appropriate for the production of seeds in Cuba, because the low temperatures cause an extension of the crop cycle that contributes to a greater synthesis and accumulation of carbohydrates (16), which positively influences the germinative vigor of the embryo contained in the seed. With respect to this, it has been reported that the ideal climate for producing seeds is the one that presents radiation, temperature and rain not restrictive for the development of the crop; as well as stable and dry conditions at the time of grain maturation and seed harvest.

Meanwhile, Gibara and Manicaragua have been affected by heavy rains mainly associated with the incidence of hurricanes, although the first tropical storms are formed at the beginning of summer in the Gulf of Mexico and the Western Caribbean, with danger to the western provinces of Cuba. As the season progresses they occur in the Eastern Caribbean and move westward affecting primarily the eastern and central provinces. However, in this summer season, plants tend to produce lower yields as a consequence of the high temperatures that physiologically induce an imbalance between photosynthesis and respiration that affects the germinative vigor of the embryo contained in the seed, so it must to avoid the use of resources for the production of seeds at this time, and to keep safe the harvested during the winter season to avoid losses.

On the other hand, the arrivals of cold fronts and hurricanes are predictable by specialists of the Center of Forecasts of the Meteorology Institute of Cuba, which contributes to the realization of preparation and response plans by the agricultural

communities that in this case, should prioritize the production of seeds in optimal times, uplands with good drainage and guarantee of irrigation.

Although all three municipalities have been affected by drought episodes, the damages have become significant in Gibara (17) due to particularities associated with their physical and geographical situation, their precipitation regime, watershed status and population distribution conditioning that the impact of these events is acute in this coastal municipality that presents a more unfavorable situation due to its high aridity index. Among the main agricultural lines that occur in this locality, with little availability of water, are the tubers, roots and grains (18).

Unlike hurricanes, intense rains and floods, drought is a pernicious climatic phenomenon that evolves over time, so that sometimes the rural population is not clear the perception of its occurrence until the water reserves are depleted and the symptoms of water deficit are evident in the crops. In this context, an indispensable element to guarantee the production of seeds is to regulate the reserves of water for irrigation and to design communicative campaigns that implicit the message on the necessity of the saving of water.

DEMOGRAPHIC CHARACTERISTICS OF THE AGRICULTURAL POPULATION AND AGE GROUPS

The analysis of the population behavior in the studied areas showed that of a total of 421 people 56,5 % are men and 43,5 % are women.

In both sexes, 155 adults (36,8 %) were aged between 35 and 59 years, 105 young people (25 %) between 20 and 35 years old and 61 adults (14,5 %) over 60 years old (Table V).

The age of farm managers ranged from 32 to 84 with an average of 53 years in Bahía Honda and Manicaragua and 40 years in Gibara.

Table V. Age groups and composition by sex in the studied municipalities

Categories	Age group	Men			Total men	Women			Total women
		BH	Gb	Mn		BH	Gb	Mn	
Child	0-9	7	5	10	22	5	3	8	16
Adolescent I	10-14	4	6	3	13	5	5	5	15
Adolescent II	15-19	7	5	8	20	9	1	4	14
Young	20-24	9	6	4	19	6	7	5	18
Adult I	25-34	19	7	13	39	13	6	10	29
Adult II	35-59	32	26	28	86	29	20	20	69
Olders adult	60 or more	14	11	14	39	5	8	9	22
Total		92	66	80	238	72	50	61	183
Percentage (%)		21,8	15,7	19,0	56,5	17,1	11,9	14,5	43,5

Legend BH: Bahía Honda, Gb: Gibara, Mn: Manicaragua

In this sense, it was found that the heads of farms less than 35 years old represented only 2,9 %, while 67,7 % were between 35 and 59 years old and 29,4 % were older than 60 years. Note the difference in the percentages corresponding to heads of farm over 60 years that exceed in 10 times those under 35 years. This situation deserves attention in the light of the new provisions of the Ministry of Agriculture of Cuba that regulate the delivery of idle land in the form of usufruct (5), a measure that with appropriate incentives could stimulate the incorporation of young people of working age, agricultural tasks and among them the production of quality seeds.

These results confirm the judgment that the average age of the worker is over 40 years and that the Cuban labor force is in the process of aging^D. It is a process that in the field of the population-development relationship is progressively becoming a challenge for the country for its socio-economic connotation, which does not leave cause for concern for the Cuban demographers.

In relation to the above, in a study published in 2006 it was estimated that by 2015 a process of decline in the structural weight of the population group between 15-64 years would begin, with a significant impact on the population in age labor; while the 60-year age group would be higher than those younger than 15 years (19). These data have been confirmed by recent statistics stating that this aging process will continue to rise until 2035 (20).

These forecasts show that measures must be taken to benefit farmers to ensure a greater permanence and incorporation of healthy adults into agricultural work; as well as, guarantee the relief from the incorporation of young people trained in production, benefit and conservation of quality seeds.

CONTRIBUTION BY GENDER TO WORK ON THE FARM

It was verified that 63 % of men and women in the family work on average, with the contribution of women to part-time work being higher (Table VI).

In relation to this, a low proportion of female heads of farm was detected, since only four females (4,17 %) had this condition, three of them in Manicaragua and one in Gibara.

In this regard, the role of women in the development of agricultural production systems, including production, processing and marketing, should be emphasized; In addition, their domestic responsibilities, since their contribution to the evolution of these systems is of the utmost importance. It can be said that when identifying the needs of the communities, there are great differences between men and women, while they think on a large scale, women tend to conserve agricultural biodiversity as they know the needs of the home. In Latin American countries a large number are heads of household and those responsible for the selection and maintenance of the seed (21).

Table VI. Contribution by gender of family members to agricultural activities according to Home

Municipality	Total of members	Genre	Subtotal	Work on the farm	Distribution of time dedicated to agricultural work (%)	
					Full time*	Part time*
Bahía Honda	164	Men	92	70	52	14
		Women	72	35	10	24
Gibara	116	Men	88	54	58	18
		Women	28	17	6	18
Manicaragua	141	Men	81	67	52	16
		Women	60	31	12	20
Subtotal	261	Men	261	191	77	23
Subtotal	160	Women	160	83	31	69
Total	421	Men and Women	421	273	63	37

* With respect to those working on the farm, by rows

^DFariñas Lisandra y Céspedes Lauren. Envejecimiento poblacional en Cuba: ¿éxito o problema? (II) [en línea]. [Consultado: 24/06/2015]. Disponible en: <<http://www.cubadebate.cu/noticias/2015/05/13/envejecimiento-poblacional-en-cuba-exito-o-problema-ii/#.VWxleSjAkpc>>.

With the purpose of reversing the previous situation, it is suggested to take actions of sensitization regarding gender; a theme that has also been addressed in other agricultural scenarios where it has been noticed that the traditional discourse does not obviously include women as “finqueras” and quite often, we hear of “the finqueros” or “chief of farm”(22).

It was very common to register, during this study, individuals under 24 years of age with no employment relationship, which is justified by the fact that in Cuba a large investment is made in education, which, besides being massive, is free and guarantees, its citizens, access to different forms of study at all levels of education, including those with physical or mental limitations^E. To this educational system are mainly children, adolescents and young people.

EDUCATIONAL LEVEL OF FARM CHIEF

In the three municipalities, most of the farm managers had secondary and pre-university education (Figure 1).

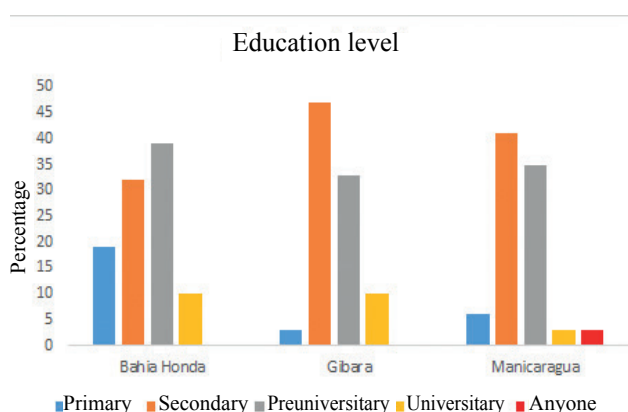


Figure 1. Educational level of the heads of farms in the Bahía Honda, Manicaragua and Gibara municipalities

These results demonstrate the potential of the heads of the farm to acquire new knowledge that contribute to a better management in their work, so it would be convenient to design programs and instruments of training and accompaniment to the development of the same ones where the contents could be adapted to themes of Interest for the roles and responsibilities of women and men at the head of the farm.

In the case of women heads of farms, one of them (over 60 years of age) had primary schooling, whereas the three women of Manicaragua (group 35 to 59 years old) had pre-university level. This result, although very small, expresses that they have adequate educational level for decision making. However, agrarian policies should stimulate an increase in the number of women in these roles, because it is known that in jobs where women hold management positions, more democratic decisions are made and more interpersonal communication channels are established with their subordinates.

Throughout the developing world, women have detailed knowledge and strong preferences for specific crop characteristics, often with different expectations and knowledge, research and policies must take these differences into account (16).

SYSTEM OF TENURE AND USE OF THE EARTH

The main land tenure system is the usufruct which together covers more than 1000 ha, where the largest areas correspond to Bahía Honda and Manicaragua. Private lands account for less than half of the land in usufruct and the largest areas correspond to Bahía Honda and Gibara. Leased land represents only 1,25 % of agricultural land in the sample surveyed. The usufruct represents 68,0 and 85,72 % of the total agricultural land in the sample surveyed in Bahía Honda and Manicaragua respectively (Figure 2).

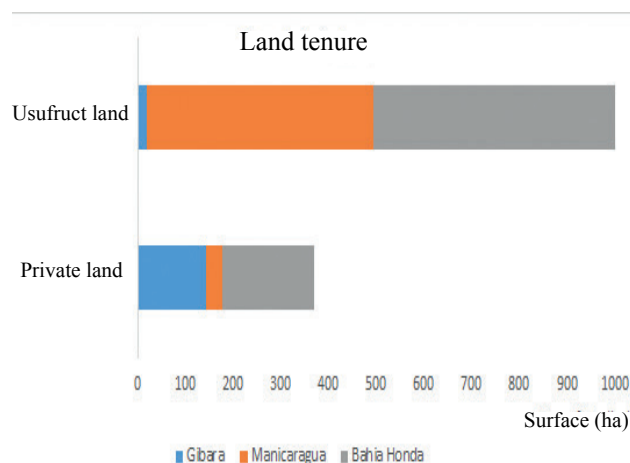


Figure 2. Agricultural land tenure systems in hectares

^E Granma. El derecho a la educación en Cuba. Órgano Oficial del Partido Comunista de Cuba. La Habana, martes 11 de marzo de 2014. Año 18 / Número 70. [Consultado: 24/06/2015]. Disponible en: <<http://www.granma.cu/granmad/secciones/cdh61/educac/a01.html>>.

Considering these results it is suggested that Gibara should enter more into the land delivery in the form of usufruct, since the national statistics make reference to that as part of the Cuban policy to increase the production of food and improving management since 2008, more than 1,7 million hectares of land have been granted to over 200,000 people.

Temporary crops predominate on farms (short cycle), while the proportion of permanent crops is very low in Gibara where only 37 % have this type of crop (Table VII), which is justified by the aridity conditions, characteristic of this locality, where the drought processes by themselves generate very damaging consequences on numerous socio-economic activities, together with other anthropic processes that contribute to the significant symptoms of deforestation.

Table VII. Types of crops grown on the farms surveyed in the municipalities of the diagnosis

Type of crop	Percentage of farms (%)		
	Bahía Honda	Gibara	Manicaragua
Temporary crops	87,5	100	100
Permanent crops	75	37	76,5
Home garden	18,7	7	14,7

It was detected a low proportion of farms with family gardens, which is a challenge because this productive modality contributes to the rescue and the biodiversity maintenance of food plants, condiments and medicinal plants in a small space, to the permanence and source of income for the family.

CONCLUSION

Considering the results obtained in this study, it is concluded that the analysis of elements of agricultural systems offers relevant and useful information in the design, management and implementation of actions to achieve local seed safety.

^F Puig Meneses, Yaima. Entrega de tierras en usufructo: al compás de la actualización. Periódico Granma. La Habana, 2 de junio de 2015. Órgano Oficial del Comité Central del Partido Comunista de Cuba. [Consultado 02/06/2015]. Disponible en: <<http://www.granma.cu/cuba/2014-01-17/entrega-de-tierras-en-usufructo-al-compas-de-la-actualizacion>>.

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