



SOME CONTRIBUTION TO IMPROVE TECHNICAL SERVICES FOR SUPPORTING AGRICULTURE AT A MUNICIPAL LEVEL

Contribución al perfeccionamiento de los servicios técnicos de apoyo a la agricultura a escala municipal

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ABSTRACT. The European socialist block collapse in the early 90's provoked a deep crisis in Cuban food system. In response to this difficult situation, a diversified agriculture emerged, replacing chemical inputs by biological ones, that is, a more intensive agriculture using local resources and the simultaneous application of scientific as well as traditional knowledge, which was officially supported by the definition of some measures, such as decentralizing productive structures and strengthening technical services to achieve a sustainable agriculture, starting from the fact that it is not enough for farmers to know and want to assume a new agricultural management, but also it requires to have skilled technicians and encouraged decision makers, who are able to provide them technical assistance with an available set of technical services for strengthening and sustaining the advance from an input agriculture to a processing agriculture. Therefore, this paper shows the results of a work performed in five municipalities participating in the aforementioned project entitled "agroecological joint: a design of sustainable choices for local food security" (Bejucal from Mayabeque province, Cienfuegos, Ciego de Avila, Camagüey and Las Tunas provinces), with the aim of knowing to what extent farmers are satisfied with currently available scientific-technical services, as a starting point towards redesigning them at a municipal level, to meet the needs of inputs, resources and technical assistance at the productive base. The main goal of this system is to succeed in joining local technical services with part of farmers' own demands and that the productive model to be extended should have the premise of a sustainable agriculture on agroecological bases; thus, three services prioritized by participants (seed-producing farms, territorial laboratory of soil preservation and management, municipal fruit and forest nurseries) were selected as well as some units with the social aim of providing technical services for pest control, like Plant Protection Stations, Entomophage and Entomopathogen Reproduction Centers and Farmer's Shops for agricultural input purchase in each municipality.

RESUMEN. La desintegración del campo socialista europeo a inicios de los años 90, provocó una crisis profunda del sistema alimentario cubano. Como respuesta a esta difícil coyuntura, emergió una agricultura diversificada, de sustitución de insumos químicos por biológicos, más intensiva en el uso de recursos locales y la aplicación simultánea de conocimientos científicos y tradicionales, que recibió el apoyo oficial con la definición de medidas como la descentralización de las estructuras productivas y el fortalecimiento de los servicios técnicos para una agricultura sostenible, partiendo de que no basta con que los agricultores sepan y quieran asumir una nueva manera de hacer la agricultura, sino que también se requiere que puedan contar con técnicos y decisores motivados y capaces, que los acompañen, ofrezcan asistencia técnica a partir de la disposición de un conjunto de servicios técnicos para consolidar y sostener el paso de una agricultura de insumos a una agricultura de procesos. Para ello en el presente artículo se muestran los resultados del trabajo realizado en cinco municipios participantes en el referido proyecto "Articulación agroecológica: diseño de alternativas sostenibles para la seguridad alimentaria local" (Bejucal, de la provincia de Mayabeque y Cienfuegos, Ciego de Avila, Camagüey y Las Tunas, en similar orden en las provincias de igual nombre), con el objetivo de conocer en que grado se sienten satisfechos los agricultores, con los servicios científico-técnicos actualmente a su disposición, como punto de partida hacia el rediseño de los mismos a nivel municipal, proporcionando respuesta a las necesidades de insumos, medios y asistencia técnica a la base productiva. Este sistema tiene como objetivo fundamental lograr la articulación de los servicios técnicos locales, y parte de las demandas de sus propios usuarios (los agricultores) y de que el modelo productivo a extender, tenga como premisa una agricultura sostenible sobre bases agroecológicas. Se seleccionaron tres servicios prioritizados por los participantes (Finca de producción de semillas, Laboratorio territorial de conservación y manejo de suelos y Viveros municipales de frutales y forestales); asimismo, se seleccionaron por los participantes unidades que tienen dentro de su objeto social también la prestación de servicios técnicos para el control de plagas ofertados por las Estaciones de Protección de Plantas (EPP) y los (Centros de Reproducción de Entomófagos y Entomopatógenos (CREE), también se seleccionaron los Consultorios Tiendas del Agricultor de cada municipio para la adquisición de insumos agrícolas.

Key words: farmers, integration, participation, technical services

Palabras clave: agricultores, integración, participación, servicios técnicos

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INTRODUCTION

In Cuba, the need to focus knowledge management and innovation together with territorial impact includes the prospect of developing a knowledge-based economy, an innovation-based business environment and a local expansion comprising local initiatives. Innovation management constitute the organization and board of resources, both human and financial, aimed to increase new knowledge and technical ideas that allow to obtain new products, processes and services or improve the existing ones (1).

To advance such innovation management purpose, some technical services are implemented for producers and are arranged according to project planning, taking into consideration the introduction of scientific results. Consequently, it is necessary to know the demands of technical services, both the ones that can be locally managed and those that require strengthening at other levels, so as to achieve as a whole the design of a sustainable management model of different productive ways at a municipal level.

The project “agroecological joint: a design of sustainable choices for local food security” has been focused on strengthening agroecological proposals to attain municipal food sustainability. Therefore, a functional strategy was designed to define three axes of intervention. One of them in this strategy focuses on strengthening local technical services (TS), based on the principle that agroecology depends more on knowledge and contextualization of technologies developed within the territory than on external inputs and application of vertically spread “technological recipes” (2).

This agroecological joint process enhances local food production, diversity and quality, where reflection-action spaces contribute to local actors’ empowerment through skill generation and access to information and knowledge (3).

The action is conceived to benefit 5,392 farm family owners with different scales, forms of

property and production, and an agricultural area of 157,756 ha that supplies a population of 850,332 inhabitants.

The objectives of this study were to determine farmers’ satisfaction of the scientific-technical services provided at present and to contribute by redesigning a supporting technical service system to agriculture in each municipality, strengthening the pest and disease control service provided by Plant Protection Stations, Entomophage and Entomopathogen Reproduction Centers.

MATERIALS AND METHODS

This research was conducted in the agricultural sector of five municipalities of the country, which has the impact of the project “agroecological joint: a design of sustainable choices for local food security” in Bejucal, Mayabeque province, Cienfuegos, Ciego de Avila, Camagüey and Las Tunas provinces.

The entire research outline consisted of three stages: I) farmers’ perception of the technical services provided, II) identification of prioritized technical service demands and III) actions proposed to address identified demands.

To develop stage I, 20 out of 50 advanced farmers from five municipalities were surveyed, who were selected because at the start of this investigation they were recognized as territorial innovators, in order to know the degree of satisfaction of the technical services given by the agricultural system. The surveyed sample accounted for 40 % of all farmers having an impact on project actions in those five municipalities; thus, an interpretation guide was made with these results, to implement surveys for 100 % of farmers involved in the project, and open interviews were also performed to 21 decision-makers and 46 members of local joint teams represented by 18 farmers from cooperative production units, as shown in Table I.

Table I. Sample composition of farmers, decision-makers and members of local joint teams considered as a research population

Municipalities	Farmers	Research population	
		Decission-makers	Members from the local joint teams
Bejucal	6	6	20 (6 farmers)
Cienfuegos	10	4	5 (1 farmers)
Ciego de Ávila	19	4	6 (3 farmers)
Camagüey	8	3	6 (3 farmers)
Las Tunas	8	4	9 (4 farmers)
Total	51	21	46 (18 farmers)

The investigation was characterized as explanatory-descriptive, since it pretends to reveal, by means of theoretical methods, the reasons of the object under investigation, with the aim of reaching the situations, customs and prevailing attitudes through the exact description of activities, objects, processes and people, trying to account for an aspect of reality (4, 5).

Subsequently, stages II and III were implemented in two municipal workshops, one for each, under the responsibility of local joint teams composed of a local project coordinator, a municipal delegation representative of the Ministry of Agriculture, an agroecological table coordinator, an agroecologist youth coordinator, a local officer for monitoring and evaluating, some representatives of the cooperative production basic units of reference and of local technical services selected; the database generated in stage I was used to determine technical service demands based on agricultural activities carried out by farmers, besides identifying the main elements in order to design the strategic and business plans of technical services that contribute to business management model.

A descriptive statistics was used as a tool for processing data, where problems were defined as an undesirable situation that has to be changed to achieve a sustained development of each particular process (6).

RESULTS AND DISCUSSION

Considering farmers' perception, the working areas offered by technical services (plant nutrition, municipal seed farms, fruit tree nurseries, forests, mini-industries) and food preservation were identified, where 80 % of farmers and decision-makers reaffirmed that quality seed availability, technical assistance and an efficient maintenance and repair service of agricultural equipments and implements as well as qualification trainings are important priorities for technical services, making some emphasis on the need of having an agricultural extension system that enables their access in each municipality.

The availability of local technical services designed to meet farmers' demands should promote the concerted action of different forms of territorial extension (7), where agricultural extension is a bridge between two different forms of knowledge: farmers' empirical knowledge, which remains essential for a successful productivity increase and scientific knowledge, which allows or contributes to enrich farmers' knowledge (8).

Then, 60 % of surveyed farmers said there is dispersion when other entities different from agriculture render technical services, since they do not meet demands and show notable insufficient services, which is one farmers' difficulty limiting the agricultural development of the municipalities evaluated.

It is important to remark the interrelationship between agricultural extension services and those of agricultural technical assistance, as they constitute the so-called agricultural innovation system, so that the latter ones are a social security component of agricultural extension. The rural extension services are defined by the Food and Agriculture Organization (FAO) as, for instance, the systems that should provide knowledge, technologies and information to farmers, farm organizations and other business actors; promote partners' interaction with research, education, agribusiness and other relevant institutions; help design practices and technical skills of management and organization (9).

On the other hand, 40 % of farmers recognize the opportunities given by the Cuban Association of Agricultural and Forestry Technicians (ACTAF), the Cuban Association of Animal Production (ACPA) and the National Association of Small Farmers (ANAP), that play an important role on farmers' assistance along different food chains through various training activities, which is a key process supporting the productive sector and without it, the necessary levels of competitiveness would hardly be reached (10).

In particular, as farmers move forward in the value chain of their products, training and qualification activities in various forms must be increasingly important. However, a widespread farmer's perception states there are few options of available training offer adapted to develop the required skills according to their needs (11).

Consequently, it indicates the necessity to fit training services to farmers' specific requirements at the local level in each territory, so that styles and methods should integrate and articulate smallholding and vertical institutional decisions, depending on the actual needs of different territories, with the increasing incorporation of all individuals involved in a particularly designed horizontal developing process of integrated management prospects and interdisciplinary approaches (12), where the ways to address productive processes are generally a result of the diversity and complexity of these methods; such processes usually involve the need of interdisciplinary and inter-institutional technical solutions that are not yet achieved so far (13).

Then, 80 % of farmers and decision-makers identified trainings as a necessary technical service to reach better results in agricultural production.

This confirms that trainings are useful to joint scientific and traditional knowledge as well as enable to improve productive processes; so, it agrees with the organization and structural proposal of the agricultural extension system from the Ministry of Agriculture in 2011 (10) that states: “training should be addressed to strengthen the own capacity of social actors to innovate, generate proposals and arrange themselves to put into practice and obtain a higher and better production” (14).

As a result of this work, the significance of training service is confirmed as a way to manage the knowledge acquired by other producers and scientific institutions over the years. In this regard, training has been described as a form of supervising rural areas and it must be based on the historical analysis of farmers’ experiences converted into social and institutional learning, besides including the contextual analysis in order to identify and interpret new demands of society and the rural world (15).

It has also been explained that training must spread a set of specific procedures and start from

diagnosis and the training process itself, which are key references to identify qualification needs, planning process, monitoring and evaluation (16).

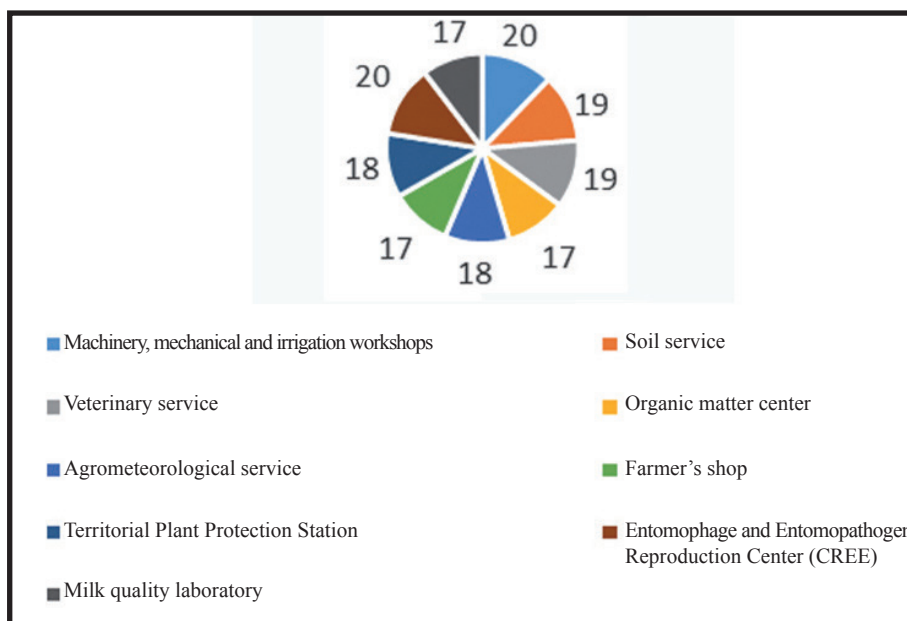
Moreover, each and every one of the participants from the group, during the training process, should be able to develop, generate, analyze, produce their knowledge, argue about their own understanding, practice and theorize on it (17, 18).

On the other hand, 75 % of surveyed individuals identified other important technical services for the agricultural development at the local level (Figure), which would enable the overall improvement of agricultural results in different productive ways.

The main elements identified within the technical services prioritized in the five municipalities complemented the strategic goals of each municipality depending on farmers’ demand at the local level.

Such elements were the causes for incompetent technical services offered, demanded service details, municipal potentialities to provide technical services, farmers’ and technicians’ view to improve the satisfaction and efficiency of prioritized technical services.

Regarding workshop results, there was a high level of farmers of each group involved and at the same time it promoted an interesting exchange between customers and service providers, where the latter ones identified demands which had not been yet considered, while farmers learned a variety of available services in the territories that had not been employed so far.



Other technical services identified by farmer

Another important aspect considered in the workshops, where farmers that needed technical services and their providers were involved, is the actors' desire, willingness and ability to encourage a change in favor of increasing a sustainable agricultural production.

On this concern, it has been noted that the success of a technology or a process of technological change depends less on its intrinsic merits than on its willingness and ability of those responsible for implementing it. The social groups and relationships between them are precisely the scenarios where changing processes are materialized^A.

This design process is based on the active participation of farmers, which allows them to be ready for everything that they want to achieve in the farm, trying to develop their abilities and view, besides enabling them to remark their needs more clearly to achieve the proposed objectives (19).

The implementation of planned actions and incorporation of other elements of technological enrichment as well as the efficient application of science and technology should project future strategies from a participatory process that will gradually emerge as the organization learns (20).

Due to the importance of this service, 60 % of workshop participants selected it as a priority and as a result of these exchanges, three essential aspects are highlighted:

- ◆ The demand for greater diversity and consistency in the local production of biological media
- ◆ The inclusion of these media in the integrated management practices of productive processes, their limitations being in the lack or insufficient service assistance and farmers' training
- ◆ The high degree of deterioration of productive infrastructure of these services

In addition, the work schedule was designed in a participatory manner for the strategic planning process of all technical services existing in each municipality (Table II); also an entity was selected in each territory, as pilot experience, to submit their planning to participants from the other services and to a farmer group at the workshop within a term of 30 days.

Results were implemented in four municipalities, analyzing the demands, constraints and actions to be taken in the Entomophage and Entomopathogen Reproduction Centers, so as to meet farmers' needs to control and manage pests and diseases with an agroecological approach (Bejucal is not included because it does not have this service).

^A Socorro, A. R. "Modelo alternativo para la racionalidad agrícola. Ciencias Agrícolas". En: *Curso sobre adopción de la práctica agrícola alternativa*, edit. Universidad de Cienfuegos, 1999, p. 25.

Table II. Project of activities for the strategic planning process of municipal technical services

Activities	Coordination	Participants
Survey to farmers	Local joint team	Agroecological tables and young agroecologist group
Processing and analysis of survey results	Local joint team	Local joint team
National workshop	Direction staff and technical team	Local joint team
Diagnosis of selected services	Local joint team	Municipal enterprises, MINAG, municipal INAG, manager and service workers
Coordination workshop of farmers-services	Local joint team and technical team	Services, farmers, decisión-makers
Socialization diagnosis with workers of each service	Local joint team and Service direction	Members of each service
Preparation/readjustment of strategic planning-business plans, investment and training plans	Local joint team	Selected-designed service team
Socialization-validation workshop of the proposal	Local joint team	Members of each service
Municipal coordination of investment plan	Local joint team	Project direction staff, technical team and planning teams
Delivery of investment plan to the direction staff and inclusion in annual plans of entities and MAE	Local joint team	LJT, service and municipal agricultural enterprise manager

Likewise, the relevance of a local production of these media was mostly identified for the appreciable differences in farmers' demands, preferences and needs of each municipality (supply, volume and time of demands), depending on the predominant crops in every municipality.

In all these partial approaches, regional economy finds special significance, since it postulates that endogenous development turns around the territorial idea at the local level, where official institutions should form strategic alliances with other institutions including NGO's and farm organizations, in order to articulate their actions effectively when coordinating appropriate agricultural and ecological/economic policies related to important aspects for small farmers, such as reasonable prices and joint markets, land distribution and access, as well as other resources and an adequate technical assistance (21).

CONCLUSIONS

- ◆ The incompetent farmers' available information on the supporting system of technical services given to agriculture nowadays
- ◆ The creation and operation of local joint teams strengthen municipal technical services and enable to meet farmers' actual demands
- ◆ The projection of activities for the strategic planning process of municipal technical services is complemented by the establishment of pest and disease control and management strategies with an agroecological approach in the municipal self-sufficient programs.

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