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Central Marta Abreu Las Villas

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Integration of University Projects to Local Development. Case of Study of Camajuani Municipality

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ABSTRACT

Purpose of investigation work that is presented was to study, with focus of Study of Knowledge Networks, integration among a group of projects of Central University Marta Abreu of Las Villas (UCLV) and Municipal University Center (MUC) of Camajuani, to actions of local development in municipality. Methods and technical of theoretical and empiric levels were applied. Plan of actions was elaborated starting from theoretical references and results obtained in investigations and field work by students of MUC and UCLV and knowledge of university projects. With this research a work way is contributed that contributes to local development in economic and socio-cultural, heading to endogenous development of Camajuani municipality. It was determined evolution, map and channels of interactions, actors and their benefits in local knowledge and innovation network arisen around university projects in Camajuani municipality.

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I. INTRODUCTION

Through their core mandates of education and research, universities contribute prominently to processes of knowledge creation, dissemination and use; they provide society with highly qualified human resources, specific skills as well as new knowledge and ideas;(Nelson, 1993; Pavitt, 1998). Asizable body of literature documents the factors that determine the functioning and efficiency of education and research systems (Lundvall et al., 2002). Universities confront a third core mandate, one that increasingly invites reflection about their roles in economic expansion, social development, political organization and governance (Göransson et al., 2009). Universities are expected to provide complementary assets that support science, technology and innovation activities carried out elsewhere within an innovation system, notably by firms.

Largely inspired by the work of authors such as (Klevorick et al., 1995), (Narin et al., 1997), (Faulkner et al., 1995) or (Cohen et al., 2002), the study of university-firms interactions is perceived as starting point for a dynamic interpretation of the importance, role, and nature of science and technology (Kruss et al., 2015:1). A rapidly growing strand of research seeksto understand the different forms, mechanisms, benefits, motivations and obstacles to interactions between universities and firms (Fontana et al., 2006; Laursen and Salter, 2004; Monjon and Waelbroeck, 2003; Sampat and Mowery, 2004; Santiago and Dutrenit, 2012; Welsh et al., 2008). In the case of developing countries, research on

university-firms interactions is at an early stage, (Albuquerque et al., 2015) set 2005 as the start date of systematic, comparative work across developing regions. The authors highlight a series of special issues that bring together the results from research projects conducted in Africa, Asia and Latin America (Dutrénit, 2010; Eom and Lee, 2009; Kruss et al., 2012).

Notwithstanding the relative novelty of research on university-firm interactions, work carried out in both developed and developing country contexts has rapidly uncovered the richness and complexity of interactions in which universities participate. Those interactions sustain innovation but also a larger number of problem solving, training and other activities that underpin an economy built on the capacity to generate and exploit knowledge (Göransson and Brundenius, 2011). From a broad perspective of institutional interactions within systems of innovation, the range of stakeholders and potential partners has increased exponentially; universities confront increased demands and expectations about their capacity to contribute to societal change, sustainable development and processes of social and economic inclusion (Arocena and Sutz, 2005; Bortagaray, 2009; Göransson et al., 2009; Göransson and Brundenius, 2011; Kruss, 2012; Pienaar-Steyn, 2012; Vera-Cruz, 2014). The literature documents the heterogeneous interpretations and approaches to this third mandate or mission for universities. (Akpan et al., 2012) and (Göransson et al., 2009) assert that concepts such as ‘community engagement’, ‘community service’, ‘university–community partnership’, ‘social responsiveness’, ‘academic citizenship’, ‘service learning’, ‘entrepreneurial university’ or ‘specialized university’ or ‘developmental university’ are used to characterize the ways in which universities seek to respond to pressures compelling them to engage in activities that reach beyond their traditional teaching and research functions. A common conclusion so far is that the capacity of universities to respond to many of these challenges is insufficient, while further research is needed to build appropriate analytical frameworks that help clarify the meaning, contexts of application and ways to properly capture many of the concepts indicated

above (Douglas, 2012; Göransson et al., 2009; Kruss and Gastrow, 2013; Pienaar-Steyn, 2012). In other words, the challenge is to make meaningful progress from the theoretical, the ideal, almost aspirational representation of the university, to the transformation of the university into an agent fully identified with and engaged in development (Akpan et al., 2012; Arocena and Sutz, 2005). This paper is a contribution to this debate.

1.1 In search of a developmental university

A lively debate exists on the ever changing relationship between universities and society; increasing interest exist on the interactions that lead to development outcomes and that involve universities engaged with a heterogeneous set of partners defined in the broadest sense possible, as civil society, government officials, and entrepreneurs (Bortagaray, 2009; Göransson and Brundenius, 2011; Kruss, 2012; Vera-Cruz, 2014). Many of these interactions are driven mostly by self-interested, socially committed researchers; frequently, they occur informally, under the radar of performance evaluation systems and linkage structures at universities (Kruss and Gastrow, 2013). Concrete experiences reflect the agendas and funding streams from international donors (Kruss and Gastrow, 2013; Santiago, 2014). The evidence suggests that interactions between universities and a broader set of partners are contextual, embedded in local history and tradition; at the same time, the analysis needs to capture how local interactions connect to global trends concerning the role of knowledge and academic changes (Arocena and Sutz, 2005; Göransson and Brundenius, 2011). In effect, the ideal is universities functioning ‘as a bridge between global flows and science and technology on the one hand, and local conditions for economic development on the other’ (Göransson and Brundenius, 2011, p. 5)

A developmental university recognizes its critical role in conducting problem-oriented research and in upgrading the productive sector through the formation of skills and the generation of knowledge adapted to local needs. Moreover, it acknowledges that in developing countries, the productive sector is not dominated either by firms

or by industry, but there is a significant participation of other forms of productive organisation in different economic sectors with very low basic scientific and productive capabilities. For this reason, the analysis should capture interactions with different, frequently informally organized, forms adopted by the productive sector (Santiago, 2014; Vera-Cruz, 2014). In these context, the use of traditional notions of innovation is problematic, rather, the concept often needs to be stretched to encompass social innovations, read large, that impact on the quality of life of marginalized communities (Kruss and Gastrow, 2013); in effect, those organizations perform based on problem-solving rather than profit-seeking behaviors where the agents engaged do so from the perspective of doing-using and interacting modes (Jensen et al., 2007; Letty et al., 2012). Research is needed to better understand the forms, mechanisms, benefits, motivations and obstacles to interactions between universities and these alternative forms of productive organizations.

Based on their exploratory study based on South African universities, (Kruss and Gastrow, 2013) suggest that interactions between universities and social actors vary by type of university, the more traditional, research oriented universities focused on traditional knowledge relations and a slow movement towards bidirectional, mutually beneficial partnership. By contrast, universities of technology, characterized by more explicit mandates and commitment to work-integrated and service learning, the interactions more likely imply some forms of technology transfer to small, medium and micro enterprise (SME) partners with students as the main channel of interaction. This observation resonates with the interest of the South African government to make students the champions of social responsibility and social and economic development through community service programmes (Akpan et al., 2012); similar aspirations exist in developed country contexts (Douglas, 2012).

(Pienaar-Steyn, 2012:41) asserts that to better understand the nature and possible development outcomes resulting from interactions between universities and a broader set of social partners requires research into 'articulated standards or

objectives with clear indicators against which to monitor progress, measure impact and evaluate effectiveness'. This research would help to appreciate the contribution of universities to development, and to inform strategies in support of such interactions by governments, higher education institutions themselves and even international development agencies. Diverse approaches have been proposed, including for example, linking innovations to economic indicators such as productivity or efficiency, but also more broadly defined notions of sustainable livelihoods or the achievement of Millenium Development Goals (MDG's) (Kruss and Gastrow, 2013; Letty et al., 2012; Pienaar-Steyn, 2012; Santiago, 2014).

1.2 The case of Cuba

Cuba offers a pertinent case to study the interactions between universities and social partners. (Pérez Ones and Núñez Jover, 2009) and (Jover et al., 2014) posit that from the late 1980s and early 1990s, teaching and scientific research at Cuban universities have increasingly become more directly and intensely involved with the economic and social development of the country; a process that has not been free of difficulties and challenges and controversies, particularly because of the bottlenecks resulting from existing dynamics, governance practices and incentive structures at universities (Jover et al., 2014; Núñez Jover et al., 2011). This is a process that has taken place in the context of an intense knowledge-driven development strategy and great expectations for the transformation of universities after the University Reform undertaken in 1962. According to (Pérez Ones and Núñez Jover, 2009:97), 'The 1962 University Reform underscored the role of scientific research and high-level training, emphasizing sciences and engineering, as well as linking theory and practice in the training of students.' The reform that took place against the dramatic changes in the institutional background linked to the economic, political, ideological and cultural transformation resulting from the Cuban Revolution. 'Social relevance and commitment to society were taken up as key values of the new university and scientific institutionalization.' (p.98). The strategic transformation of Cuban universities has

gradually taken shape including through the creation of production capabilities and the establishment of close relationships with productive agents in key technological sectors –for example, biotechnology and medical-pharmaceutical-, and the creation of specialised offices to facilitate technology transfer from universities to firms (NúñezJover et al., 2011). Cuban universities operate based on an “interactive model” under the assumption that society is much more than market; thus knowledge and science can meet commercial demands, but mainly social necessities, demands for equity and social justice (Jover et al., 2014; Núñez Jover et al., 2011).

(Pérez Ones and NúñezJover, 2009) recognize that this positive dynamic of interaction between universities and the productive sector has not necessarily followed pace in other areas of social and economic relevance. However, explicit efforts are underway, including efforts for the decentralisation of policy decision-making, the recognition of non-state owned productive organisations, notably private and cooperative forms, and the creation of municipal university campuses with a mandate to contribute and promote local development based on knowledge and innovation (Jover et al., 2014; Núñez Jover et al., 2011). Research that looks into the nature and results of interactions between Cuban universities and social agents is still limited.

Different interaction forms according to motivations and address of knowledge flows in both addresses or unilateral provision of intellectual resources of innovation producers organizations toward companies and society are: traditional form of interaction where knowledge flows from innovation producers organizations toward companies. Their content is defined by its conventional roles (teaching and investigation); Of services: reason is to provide scientific and technological services that get paid, knowledge flows from innovation producers organizations to companies; Commercial: motivated by an intent of marketing scientific products generated in innovation producers organizations, knowledge flows from innovation producers organizations to companies and Bi-directional: motivated by long term objective of creating knowledge in

innovation producers organizations and to innovate in company, knowledge flows in both directions and both agents provide resources of knowledge. (Dutrenit, 2015).

Construction of interactive processes, conformation of alliances between actors and daily learning in networks formation are characteristic of science, technology and innovation at moment. These processes have been identified in literature for a lot of low time linking concept, being emphasized mainly linking university / company. However, like it has been documented in numerous studies processes of knowledge and innovations generation they imply participation of a wider group of actors. (Casas, 2015)

One of analytic bases that sustains idea of knowledge networks is the position of Sabato and Botana about necessity of integrating 3 vertexes of triangle that it would allow local development: investigation, production and government support institutions. Of there part focus of innovation systems and especially, of regional innovation systems.

Triple Helix focus tries on innovation systems based on relationships among university, industry and government. It is broadly grateful for their importance like base institutional dynamics for creation of goodness in sense of well-being and sustainable development through knowledge generation and their effective application.

While focus of Innovation Systems puts accent in economic logic, networks focus makes it in social logic, Innovation Systems put accent in companies and Triple Helix in universities. When focus of Innovation Systems and Triple Helix has made emphasis in innovation, networks focus has made emphasis in knowledge, from perspective of its generation, distribution and use. (Dutrenit, 2015).

For knowledge networks studies in Latin American context universities and investigation centers have had a central importance because they have given rule to analyze "third mission of universities", in measure that in last decades many universities incorporated in their mission, besides teaching and research, their contribution

to socioeconomic development, and they implemented a wide repertoire of linking mechanisms with companies (Casas and Luna, 1997 and Casas, 2001) and they have shown importance of knowledge generated in universities for society.

It is appreciated in Cuba a tendency to a theoretical production without bond with practice and a practice without due academic foundation. This prevents to systematize and to disclose good practices that are taken to end in some places of country and that can serve as reference in other territories. (Núñez et al. 2006)

The linking of university and territory projects makes that generalizes good practices and those be used for benefit of municipality. "Dissemination of Participative Phyto improvement in Cuba" a precedent went to Project "Program of Local Agricultural Innovation" (PIAL). It had as starting point a conventional agricultural innovation from academy, where extensionists disseminates results so that farmers adopts techniques and practices according to their necessities.

In Camajuaní municipality exists integration among key areas for territorial development and several university projects. This article is related with work carried out in the municipality with projects PIAL, Coinnovación and Agrocadenas. Their general objective was: To contribute to study of interactions of academic institutions with social and productive sectors so that good practices contributed by University Projects are implemented in Municipal Strategy of Local Development and Local Innovation Groups consolidate as participation spaces in Innovation Platform for Local Development.

II. MATERIALS AND METHODS

2.1 Case study: Participation of University Projects in local innovation

As previous action, they were carried out, for students of municipality, belonging to several careers of Marta Abreu Central University of Las Villas and guide professors of Camajuaní Municipal University Center, a diagnosis from their labor practice, coexistences with actors in cooperatives and Theses of studies culmination.

Case study went toward work that carry out productive units that are sample of trust of Projects: PIAL, Coinnovation and Agrocchains for development of territory. Students of Agricultural, Sociology, Social Communication and Sociocultural Studies careers participated.

By means of documents study, regularities were determined on Initiatives of Local Development (IMDL) manifested in investigations of theses of Sociology and Sociocultural Studies careers students' of MUC.

In whole process of work organization we kept in mind methodology for knowledge management of Lage (2005) that outlines that knowledge management supposes: a) actors' identification; b) construction of networks; c) build conectivity; d) stimulate and organize interactions; and) create in companies capacity of assimilating knowledge and technologies; f) arm "closed cycles" across direction by projects; g) implement training for a lifetime; h) select, qualify and evaluate directives; i) build infrastructure (informatization among other demands) and j) build and evaluate indicators.

We kept in mind three focuses of networks that have influenced in study of knowledge networks that it can work as complementary and starting from them analytic marks can be built: 1. Analysis of Social Networks (ASN) or formal analysis of networks that is in charge fundamentally of networks morphology and it allows to deepen in study of social structures that underlie to knowledge and information flows. Its application to study of collaboration in I+D is novel. 2.. Focuses based on "Theory of Actor Net" (TAN), where net notion has a bigger theoretical statute because it tries to decipher complexity from bound phenomena of innovation, and in particular to diffusion of innovations, with base in recognition of importance of learning. It is in charge of processes, dynamics and evolution of networks and of building analytic models to describe their trajectories and 3. Focus of network like integration mechanism, inscribed in theories of social coordination, of half range. (Casas, 2015) Methodological approach that we have built starting from mentioned influences, has considered following dimensions: 1: morphology: actors that participate, their interests and

motivations; when they enter or they leave scene. 2: genesis and dynamics: forms like are coordinated and interact participant actors; which their integration forms and form in that approach conflicts, they solve problems and they make decisions. 3: nature of knowledge flows that take place in context of network: what actors exchange, which channels are for exchange (mobility), what effects they have in improvement of new products and/or processes, nature of knowledge that is exchanged (coded, tacit), if impact is direct and immediate, what kind of information it exchanges: market, technique, scientific; what type of knowledge: devise, abilities, experience, methods and 4: impact of knowledge network in: formation of human resources; processes/products improvement; New processes/products; solution of an economic or social problem and opening of new investigation and of basic investigation lines.

This way, we socialized with communities antecedents of work and basic principles of PIAL, Coinnovación and Agrochains projects in territory and contributions that make for local development. Then were taken to end coordination actions and elaboration of annual operative plan (AOP 2014 or 2015) for Municipal Platform of Local Agricultural Innovation.

Specific objectives of University Projects with Platform of Local Innovation were: To contribute to invigoration of municipal capacities for local development starting from good practices contributed by University projects and to create capacities in government and local actors to formulate and implement strategies, programs

and municipal projects with agricultural, of gender, concerted and sustainable focus. Four transversal axes were seen: genetic and technological diversity, gender transversalización, adaptation and mitigation to climatic change and work with women and youth.

III. RESULTS AND DISCUSSION

3.1 Clasification of interaction channels

Interaction channels among University, represented in territory by MUC and productive sectors, services and local authorities are represented in the Table 1. By means of them, University comes closer to problems of the Municipality in periodic diagnoses and obtains pertinent investigation topics. Meanwhile society receives scientific results obtained in academy that can be introduced to social practice with growing increment of quality of population's life, principal objective of our economic-social formation.

Contrary to most of consulted studies that concentrates on university-company relationships, our case study includes relationships of university with social, productive and of services actors, and mainly with Government and local authorities. This result is based in that Cuban university fulfills social objective of advising to Government, Companies and Organisms in its Development Strategies and training of its directives. Ministry of Higher Education advises, at central level, to Government in Strategy of National Development and it directs National Schools of Directives Training.

Table 1: Interaction channels in Local Network of Knowledge and Innovation Management

CHANNELS	WAYS OF INTERACTION
Traditional	Conferences and Meetings, Publications, pamphlets and folding Work of students in their communities
Services	Actors' training in situ and in MUC, Informal consults Professionals give classes in MUC and professors go to companies Consultancy and technical attendance and Technical Advisory Council of Government
Commercial	Patent and registrations of varieties, computer and of intellectual property Creation of educational Units in Companies and Organisms (spin-off) Sale of seed of new varieties, sementals and strains of microorganisms
Bidirectional	Institutional and Managerial projects, Combined projects of Innovation - Development Office CIH in University contract investigations and introduction of results

Benefits obtained by investigators, government, companies and organisms product of relationship

among university, represented in territory by MUC, productive and services sectors, and local

authorities are represented in Table 2. These resemble each other reported by Dutrenit (2015) for Latin America although order of priority changed. In our study have priority search of benefits of social recognition for investigators and

work group to improve quality of local life in productive and service sectors, and government. It responds to priorities of Socialist Social System that reigns in Cuba.

Table 2: Analysis of benefits in Local Network of Knowledge and Innovation Management Researchers

CHANNELS	FORMS OF INTERACCIÓN
ECONOMIC	Financial and material resources to research Pay of publications and participation in Scientific Events Access to use of technologies, reactivos, seed and equipment
INTELLECTUAL	Social Recognition Appropriation of organizational and technical know how Possibility of diagnose to obtain pertinent investigation themes Empowerment in government decision centre for consulting position

Companies of productive services sector and government

WAYS OF INTERACTION	BENEFITS
Technological surveillance of tendencies in field and obtain training at measure of necessities To be able to hire services of environmental and social diagnostic and t obtain support in knowledge and innovation management	Related with long term innovation e strategies
To request manpower to form in Academy with prospective and to use it while they study To obtain consultancy to solve problems of productive process ex ante y ex post Use of tests and quality laboratories and prove products and services at pilot scale.	Related with short term production activities

3.2 Relation between channels and benefits

We coincide with Dutrenit (2015) in that agents have different motivations, value different types of knowledge and obtain benefits of different nature. Also, they generate different benefits for each agent. Investigators and companies prefer channels of services and traditional and informal interaction forms and those wrap human resources. Equally, commercial channel, with obtaining of patents, incubators, spin off, etc., is less important for both agents.

In study we have discovered that, like it is a regularity in Latin America (Casas, 2015), effect that have innovation and investigation projects is very positive about benefits obtained as so much for companies and organisms of municipality like for professors and investigators of MUC and University.

We also find that while nearer is collaboration among actors, combined university projects have more positive effects on quantity and quality of academic publications presented in Congresses and published by academics, mainly if it was carried out together with their partners in society. Example of it is that most of directives of companies, organisms and government in our

municipality possess scientific categories of Master or, at least, have some Graduate study in their specialties.

3.3 Paper of students in the municipality

Recently graduate students have become an exchange agent to foment innovation in companies, organisms and Municipal Government. We are able to prepare them to play that paper of interface among results of their professors that are investigating in University and companies, organisms and municipal authorities of their town, during their entire career.

In their curriculum, although they are studying outside of municipality, it is hired with University that formed them that all productive practices, course works and their investigation of Diploma Work are carried out in the municipality, solving a problem whose solution contributes to Local Development.

We have experience in achieving that graduates of municipality don't emigrate with otorgation, since they were students, of a job in the municipality that guarantees him an interesting work, implementing in local socioeconomic life results of investigations that as student they carried out.

This leaves clear that is necessary to formulate new politicians that promote a bigger impact on graduate students to stimulate interactions and, by this way, local innovation.

Table 3: Actors and interactions of Local Network of Knowledge and Innovation Management

No.	Actor	Institutions	Interactions
1.	CLIA Camajuani	MUC, Municipal Delegation of Agriculture, Municipal Bureau of ANAP, Agropecuaria Compant Luis Arcos, ACTAF, ACPA, Local Governrnt, MUC of Health, Municipal secretariat of FMC, Municipal Committee of UJC, CDR, CITMA, Movement of Science and Technique Forum, CCS, CPA, UBPC.	Position of demands and ideas of projects. Reception, Discussion and decision of local priorities. Discussion/decition of Annual Operative Plan (AOP) Administration of coordinated actions. Knowledge and Innovation management. Evaluation and monitoring of Network. Documentation and systematizing of results and impacts. Combined preparation of Projects, Programs, Lines and Strategy of Local Development.
2.	Municipal Group of Local Development Projects	MUC Camajuani, Municipal Delegation of Agriculture, Municipal Bureau of ANAP, Agropecuaria Compant Luis Arcos, ACTAF, ACPA, Local Governrnt, MUC of Health, CITMA, Movement of Science and Technique Forum.	Position of demands and ideas of projects. Reception, Discussion and decision of local priorities.. Administration of coordinated actions. Knowledge and Innovation management. Evaluation and monitoring of Network. Documentation and systematizing of results and impacts. Combined preparation of Projects, Programs, Lines and Strategy of Local Development.
3.	Polítical, government and of masses Authorities	AMPP, PCC, ANAP, CDR, FMC, ACRC, UJC.	Position of demands and ideas of projects. Recepción of demands and ideas of projects. Discussion and decision of local priorities. Administration of coordinated actions.
4.	Municipal and province´s organisms	MINAGRI, MEP, MES, CITMA, MINED, MINSAP, MTSS, ONE.	Position and Recepción of demands and ideas of projects. Discussion and decision of local priorities. Administration of coordinated actions.
5.	Universities, Centers of Investigation, Media.	UCLV, UNICA, CENSA, INCA, ICA, CIAP, CEDEM, Radio CMHW, Caibarién Radio, Tele Cubanacán, Rev. Agricultura Orgánica.	Position and Recepción of demands and ideas of projects. Discussion and decision of local priorities. Administration of coordinated actions. Knowledge and Innovation management.
6.	ONG and other movements.	ANAP, Movement of Science and Technique Forum, ANIR, ACTAF, ACPA, ANEC, APC, COSUDE, HIVOS.	Position and Recepción of demands and ideas of projects. Discussion and decision of local priorities. Administration of coordinated actions.

3.4 Regularities about situation of IMDL in thesis of Sociology and Sociocultural Studies of MUC

Municipal Directives has training lack on knowledge management, requires abilitie in Local Development.

- Limited activities, of Council of Municipal Administration, directed to impel Local Development
- Little interrelation with local actors that can contribute to development.
- Limited exploitation of local resources and not recognizing necessity to combinate endoge-

nous and exogenous factors that can lead to local development.

- Lacks in government of a defined Strategy of Local Development.
- Insufficient orientation actions and local agents' preparation.

Main characteristics of municipal productive distribution obtained in diagnosis carried out by means of participative observation in productive spaces and directives of Cooperatives and Management Systems of ANAP were:

Table 4: Fundamental products that were cultivated in the municipality in the period

Products	Volume of annual production	Varieties
Beans	84.1 t.	3
Corn	198.8 t.	2
Banana	272.2 t.	4
Yucca	152.0 t.	1
Sweet potato	51.0 t.	2
Malanga	130.0 t.	1
Rice	850.0 t.	3
Tomato	250.0 t.	2
Yam	83.0 t.	2
Mango	156.5 t.	5
Peanut	134.8 t.	2
Other fruits	150.0 t.	-

Table 5: Productions in cattle segment

Product	Volume of annual production
Cow milk	965 000 l.
Pig meat	260.0 t.
Ram meat	16.0 t.
Rabbit meat	6.0 t.

3.5 Impacts of Innovation made by University Projects in the municipality

Seed productions are carried out in own productive units except for seeds of tobacco. Means of work of animal traction are already used, fundamentally American plow, Creole plow, tier of prickles and farmer, thrown by oxen.

Integration of animals to agriculture-ecosystem arrives in properties to a range from 1 to 1,5 mature animals for hectare although properties are possessed with a range from 0,3 to 0,5 mature animals for hectare and properties with a range of 0,5 to 1,0 mature animals for hectare.

Level of recycling of system is given in use of organic residuals without breaking down for slowness of process, insolent organic residuals on surface of soil and use of some techniques of recycling of residuals of property. There is 10 biodigestors mounted in properties with big swinish breedings and in 45% of properties compost crop remains for organic fertilization and to eliminate pathogens and pests.

Conservation of vital functions of agriculture-ecosystem is manifested in a general way in practices of sowing alive fences, breaking new ground against the slope, rotation of cultivations, use of biological means in handling of pests,

policultives, natural patches of vegetation, use of repellent plants for pests and conservation of good quality of landscape.

As for handling of pests and diseases fundamental actions go directed to alternative use of chemical products with antagonistic bacterias and fungi, efficient microorganisms, biological control, predators and cultivation rotations for handling of pests and diseases and majority use of MIPE with products of properties.

The resources of energy of used agroecosystem are combination of external inputs with animal traction, human energy and other inputs of property like seeds. Wind mills are generalized in properties for extraction of water of wells, mainly for attention of livestock.

Project Coinnovación closed its cycle leaving formed to multipliers of its experiences, 3 Centers of Production of Efficient Microorganisms, a Shop of Production of Silos to conserve seeds, inputs to work Agroecology and to modernize center for reproduction of Entomofags and Entomopathogens (CREE) and 3 reference Properties in municipality. In their shops they spread agroecologic technical that producers considered more useful under local conditions.

PIAL Project begins its third phase and with her it seeks to contribute to decentralization of taking of strategic and financial decisions from program to municipal level. In initiatives that start it prevails chain focus or work in net. Synergy is propitiated among actions of program with other local initiatives, structures and municipal organizations. Institucionalization of good practices of program in strategies provides to give priorities to society, institutions and municipal organizations.

Training in Sustainable Development and Strategic Address for 65 directives facilitated taking of decisions for: President, vice-presidents and officials of AMPP, Presidents of Popular Council, Directors of Companies of Local Subordination, Specialists of Science and Innovation in Companies and Professors of 4 MUC. Training of a critical mass of specialists, leaders, peasants and residents are vital for invigoration of local innovation as alternative of agricultural development.

Actors of agricultural sector were qualified in 97 training actions with 4.261 actors' participation. MUC, involved with local actors, strengthens local systems of seeds and innovation in Agriculture. 7 Centers of Biological and Agricultural Diversity and Local Agricultural 7 Groups of Innovation were constituted, Local Agricultural Platform of Innovation (PIAL) with their Annual Operative Plan (POA).

Local biological and technological diversity was increased, having bigger number of technologies, varieties and clones, races of vegetable species and animals with an increment of yields of viandas cultivations in 12% and grains in 8%. it was achieved in two properties productions of ecological bean with yields of 1,8 t./ ha.

Network utilities were increased by concept of increments in diversification of production, revenues for sales of seeds and products of added value and decrease of production costs and actors' of municipality sensitization, toward employment of agroecologic practical in foods production.

Empowerment was achieved from woman when assuming producer role, what confers them identity and strengthens taking of decisions.

Knowledge flows toward territory favor introduction of new technologies that impact favorably in agricultural production in municipality. Increment of relationships with educational, scientific and investigation institutions in productive base of territory, increased municipal alimentary sovereignty.

Generation of new employment sources for women, bigger adults and youths in territory facilitated a sustained increment of participation of women, bigger adults, children, adolescents and youths in training spaces and innovation. This has also strengthened interdisciplinary focus in solution of municipality problems with sinergic appropriation of scientific methods, technical of investigation and technical language.

We had great improvement of curricula of Municipal University Center with 27 agricultural professionals' formation, 5 Master in Agricultural Sciences, a Master in Sustainable Agriculture and 2 Doctors in formation.

We leans on taking of local actors' decisions on which technologies to adopt and to introduce for what integration between University and society facilitates access to genetic and technological diversity to local actors. Also training to Directive Meetings of rural cooperatives, starting from a command of ANAP Congress, gave an overturn to performance of ANAP in the municipality.

3.6 Principal strategies that support the university projects

Free access to the genetic and technological diversity and stimulation of experimentation "in situ" and exchange and local dissemination of genotypes and knowledge to consolidate innovation groups or primary centers of genetic and technological diversity, with support of local institutions.

Develop and implementation of learning processes in an action that supplement the curriculum of degree and pre-degree students, technological transfer and creation of capacities and abilities in producers and decisors.

Development of concrete initiatives that contribute to diminish the vulnerability in front of

the climatic change and to mitigate the emission of gases of hothouse effect

Develop of positive actions to contribute to the gender justness

Decentralization of planning, implementation and evaluation of actions and strategies of Projects at the hands of local institutions that coordinate the work of Local Centers of Agricultural Innovation and groups of local innovation.

The work with focus of agricultural chain, where all the links should be developed in function of adding value to the agricultural productions.

3.7 Functions of Municipal University Center to the linking with local development

- It is not limited to the formation of professionals; their capacity to produce, to diffuse and to apply knowledge is increased to the functions of Investigation and Technological Innovation, Superation of Graduate degree, Training of Directives and University Extension, among others.
- It takes to the Territory a Local System of Knowledge and Innovation Management to participate actively in the development, interacting with all the actors of the Municipality.
- It facilitates the knowledge of people and institutions that nucleate to their surroundings to the service of the solution of the problems of the Territory, arising a new collective actor able to favor the creation of competitions for the management, assimilation and creation of knowledge of social significance, always linked with the remaining political, administrative and educational actors of the territory.
- It participates to establish connections that allow the local flows of knowledge.
- Their mission is to act as outstanding local agent, dinamizer, able to identify the local problems and to collaborate in social construction of knowledge that facilitates its solution.

3.8 Procedures accepted and assumed by the Local Innovation Platform

1. Exchange among actors. (Productive units, Properties, Cooperative, Government, CITMA, ANAP, MINAGRI, PCC, FMC, UJC, UCLV and CUM, among other)
2. Use of spaces with the mission of advising the actors on the good practices of the University Projects PIAL, Coinnovación and Agrocadenas.
3. Training to actors in charge of the processes.
4. Socialization shops between producers and social actors in the community.
5. To support Strategies of the municipality in the Government, Companies and Organisms.
6. To create municipal platform for the reflection on the results of the diagnosis and the elaboration of actions of the Platform of Local Agricultural Innovation.
7. Concretion of the agreements in the Strategy of Local Development of the municipality.
8. To disseminate good practices from the Platform to producers and communities.
9. Evaluation and annual upgrade of the results and diagnostic.
10. To create Indicative r of acting to measure r impacts of the work.
11. Systematizing of the obtained results.
12. The Plan of actions agreed in the Shop of Annual Operative Plan 2015 (POA 2015) carried out in the Theater of ANAP with Government's participation, ANAP, CUM, UCLV, Cooperative, Delegation of Agriculture, Physical Planning and all Organisms and implied Companies are exposed in the Chart 1.

3.9 Procedure adopted in the POA 2015

1. Exchange among subject of the Local Development. (Party, Government, University, MUC, organizations of the civil society, ONG and other actors.)
2. Creation of an instance, office or another denomination, with the mission of auxiliary to the government in the whole work related with the local development
3. Training process to subject of the Local Development.
4. Elaboration of the characterization of the municipality for the advisory Technical

- Council (CTA) and the government's auxiliary instance for the development.
5. Space reflection group on the results of the characterization.
 6. Upgrade of the proposal of Prospective, Strategy of Community Local Development, Program and Projects of the municipality previous analysis of the prospective and base strategies.
 7. Analysis and approval for AMPP of Local and prospective Strategy of Development.
 8. Concretion of agreements in Plan of the Economy to add them to the Budget.
 9. Evaluation.
 10. Systematizing.

Table 7: Plan of actions agreed in the Shop of Annual Operative Plan 2015

Objective	Acción	Participan	Responsable	Fecha
1. To strengthen municipal capacity for local development starting from good practices contributed by PIAL, Coinnovación, Agrocadenas	<ol style="list-style-type: none"> 1. Linking of topics of studies culmination to problems of the territory. 2. Carry out coexistences in CPA Rubén Martínez. 3. Students' linking of UCLV to Labor Practice to the territory and PIAL. 4. to carry out the diagnosis. 	Professors, students local actors	Professors Professors and decisors. Professors Professors and decisors.	First stage
2. To create capacity to formulate and implement strategies, programs and municipal projects with agro-pecuarian focus, of gender, concerted and of sustainable development in government and local actors.	<ol style="list-style-type: none"> 1. To create the platform. 2. Realization of participative workshop to elaborate POA. 3. Creation of exchange space. 4. Carry out Shops of seeding of varieties of seed of corn with women's participation and young. 5. Training in investment projects and microindustries for the professors of PIAL and MUC Camajuaní for Economy Faculty. 6. Training and exchange of grasses and forages, to elaborate local cattle foods and reproduction of bovine livestock. Visit UBPC Landing of the Granma. Exchange experiences of Leadership with youths. 7. Commercialization Fair with innovative women in greeting at March 8 8. Training on investment project and Microindustry. Exchange among producing with results. 1. Realization of 2 shops of training of coffee and fruit-bearing. 2. Training in gender, rural development, innovation and analysis of social networks. 3. Training swinish rabbits and birds in Placetas. Exchange of products and among producers. 4. Shop training in agroecological practices: conservation of soils, compost elaboration and biodigestores. 5. Fair of corn 6. Shop and seeding of varieties of bean seed, with participation of women and young. 	University Professors Local decisors Young producers Members of platform, producers, implicated actors Women and youngs govermetn, MUC, ANAP Young producers.	University Professors Local decisors University Professors Local decisors University Professors Local decisors Specialists Specialists Members of platform Specialists Specialists, producers Specialists, producers Members of platform Members of platform	Second stage
2. To implement strategy, programs and projects in Platform	<ol style="list-style-type: none"> 1. Shop of Evaluation POA-2015. 2. Gender shop. 	Platform Women and youths.	Professors, producers and decisors	Third stage

VI. CONCLUSIONS

1. The alliance of the MUC with the University Projects Program of Local Agricultural Innovation, Coinnovación and Agrocadenas has had an essential role in the bond university territory for the Projection of the Local Development in the Municipality Camajuaní.
2. For the local governments it is necessary the bond with the University Projects by means of the MUC so that the realization of synergies is propitiated among projects that provide the development of the territories
3. The participation of the MUC and other local actors, under the direction of the Government, in the dissemination of the good practices contributed by the University Projects Program of Local Agricultural Innovation, Coinnovación and Agrocadenas generated processes of local innovation based on strategic processes and participative dynamics.
4. Importance of fomenting several interaction forms and of the students for the companies and organisms
5. Politics's formulators should put emphasis in promoting those characteristics of the investigators and companies that are more tuned to generate practices of linking.
6. For Investigators all the channels except the commercial one generate intellectual benefits. The channel of services is the most effective to generate economic benefits but in the companies the bidirectional and traditional channels are the most effective to generate both types of benefits.

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