

Modalities and results of collaborative research in the livestock sector of Martinique.

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The challenges of global change are expressed in different interrelated areas: Climatic crises, Food sovereignty, Sanitary concerns and Environmental protection. In the context of Martinique (French West Indies), the URZ programs sustained the key role of animal in the food chain system to cope with these challenges. For fifty years, the URZ has been supporting Martinican livestock production (MLP) through varied actions (research on station, on farms collaborative trials, training, expert missions, etc.) to address the biotechnical problems. This has led to a strong partnership with professional organizations and decision-makers. Close partnership with stakeholders, recognition of the realities of agrosystems, surveys of farmers and value chain agents, collaborative *in-situ* research among breeders are all elements showing the societal dimension taken up by this work. Thus, the URZ has informed, through the Martinican case study, the two sub-compartments (biotechnical and human) of the conceptual model that is the livestock system.

1. A grid describing the different partnerships.

The team was at the heart of an iterative loop between fundamental, academic, laboratory and field partnership research with professional organizations (POs). This was implemented by either taking on, the role of initiator, facilitator or others, and this according to different modes :

- **Studies including a step** of surveys with actors (A) and/or experiments at the farm level where it was a question of carrying out typologies according to the system functioning, the feeding practices and/or the genetic policy. These have allowed the research (R) team to learn from the breeders, to develop a well-founded research question (bottom-up) adapted to the environment, conditions and resources of the livestock sector ;
- **Constant feedback** between A and R, implemented mainly in the case of breeding programs (speaking of A expectations and A & R knowledge). There were constant back and forth of : questions-answers, administrative failures-innovative methodologies, strong integration into the project or minimal support. A real organisational innovation has been built in terms of co-constructing the issues, methods and networking of actors. This means a progressive and adaptive URZ/PO partnership approach. First developed as part of the Ovin-Martinik breeding program, this paragon was applied to other species ;
- **Actors generating the process** of studies to address a specific problem described by them. In these cases, the research mobilized its expertise and its know-how to answer the question formulated by A (mainly POs). But often, i) there was a need to reformulate the question; ii) it was necessary to mobilize other actors or researchers (under the coordination of the URZ) and iii) real difficulties of power games arised, especially when the demand of the actors was misidentified and biased by the power of decision (or even financial) of these same actors;
- In a general context of **dissemination, sharing of knowledge** (technical sheets, training-teaching, technical supervision) inherent to our regalian function and under the pressing needs of the sector. This showed that knowledge sharing (between R and A) was enriching and beneficial for both. It was implemented through the elaboration of methods adapted to the diversity of the actors (their nature, objectives, functioning, expectations, etc.).

However, it should be noted that there was no theoretical framework or the application of previously developed methods since every step was adaptative. In some cases, there was a need for the attendance of the institutions (example 3) or the need to keep a certain degree of freedom (example 1). On the other hand, it is necessary to insist on the existence of an incessant impregnation of Research-Action : for example, the experimental station always kept 'doors opened' and the team URZ has developed strong implicated and involved research programs. It has evolved from a foundation of practices and working methods that were specific to us and that have also given us a certain legitimacy, namely to be in adequacy with the environment (biophysical and socio-economic) and to directly include farmers' issues and problems. Even if, this involved research is being in progress (in its failures and success stories), in any case, these historical relationships give legitimacy to the designing of innovations embedded into the territorial development.

The team's posture has preserved the scientific dimension of its links with the sphere of animal sector, but sometimes suffered from power struggles. It questioned a real functionality-applicability (who's objectives for what?). It is now necessary to take advantage of this history (which methods?) and to integrate the situation of coexistence models (formal vs. informal sectors and/or dominant vs. dominated economy). Also, this plural posture of the URZ must also be enriched by methods, undoubtedly curving its positioning in order to implement co-design work or even a real research-intervention method.

In this line, the **perspectives are to co-design** livestock systems under a process of continuous iterative partnership with its adaptive dimension (not always designing *de novo* systems). The actors/researchers consortium takes advantage of past experiences to develop new ones, especially in the posture where everyone learns from each other and constitutes a community of knowledge sharing.

2. The main results

For 50 years there has been a real increase in knowledge and techniques to better situate livestock farming in relation to its territory. The main lines of work were designed to enhance local food resources [1 ; 3]; to promote tropical genotypes [2 ; 4]; to remove health and pollution constraints [3] and to question iv) in which livestock systems [2 ; 4]; v) and for which products [5] while vi) promoting agro-ecological practices [1 ; 3]. We have chosen to illustrate this with selected examples listed in Table 1.

Table 1. Some results of collaborative researches and their impacts in the livestock sector of Martinique.

| Studies on : | Have allowed or generated : | With Partners* |
|--|---|--|
| In the domain of feeding strategies (FS) | | |
| Nutritional value of tropical fodders | Designing grazing systems with large and small ruminants associated or not | CEMAGREF, SECI (now SEA), SCACOM, CODEM, CDA, AMIV |
| Forage conservation (hay and round wrapped bales) | Support a hay production local subsector | |
| Feeding with banana (silage or fresh fruits) and pineapple byproducts | Creation of cattle fattening units. | |
| In the domain of breeding programs (BP) from years 1990s for sheep and 2000s for Brahman cattle | | |
| A 20 year-assessment of performances and genetic variation | Data and factors of variation, technical references on reproduction, growth, health. | |
| Expert missions ; technical reports databases analyses ; methodological supervision | Application for national accreditation, qualification grid, breeding schemes, creation of selection centres | USOM, EBBM |
| In the domain of meat quality | | |
| FS and BP interactions | Description of meat quality of Martinican ruminants | PARM, AMIV |
| | Labelling studying and implementations | |
| Use of local feedstuffs with OvinMartinik | Niche market under a PNRM label | PNRM, MMPM, SCACOM, SEA |
| Use of pastures and Brahman cattle | Generating a Martinican project for bovine sector (in collaboration) | PARM, CDA, CODEM, GDS |
| Use of Feral Creole pig and non conventional feeds | Feasibility study to build a niche market (on-going) | PNRM, CDA, COOPMAR |

*) Association Martiniquaise Interprofession Viande, Association Martiniquaise Production Mouton Marquée, Chambre d'Agriculture, Centre d'Etudes du Machinisme et Genie Rural, Coopérative d'Éleveurs Bovins Martinique, Coopérative d'Éleveurs de Porcs Martinique, Pôle AgroAlimentaire Régional Martinique, Parc Naturel Régional Martinique, Société Coopérative Éleveurs Ovins Martinique, Station d'Essais en Cultures Irriguées, Unité Éleveurs Bovin Brahman Martinique, Unité de Sélection Ovin Martinik.

Optimisation of tropical genotypes rearing, exploitation of the full potential of local feed resources, integration of crop and livestock activities, remediation of health problems through integrated models were at the forefront of agroecological practices in MLP. Mutually, breeders, stakeholders and researchers, have enhanced local resources and know-how, promoted better farm's functioning, some 'niche markets' and have improved food economy and favoured breeder's wills and skills of the Martinican territory.

Acknowledgements i) to previous policy-makers (Conseil Général Martinique, Conseil Régional Martinique) and ii) current Collectivité Territoriale de Martinique, iii) to breeders, partners and professional organizations (table1) and iv) to Aumont G., Boval ML., Chemineau P., Mandonnet N., Matheron G.

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