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PARTNERING FOR SUSTAINABLE AGRICULTURAL DEVELOPMENT - THE CASE OF CARDI AND PARTNERS IN THE DEVELOPMENT OF THE GOAT INDUSTRY IN JAMAICA

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ABSTRACT. Partnering with relevant institutions and agencies is intrinsic in the design and execution of CARDI's R&D programmes. In Jamaica, CARDI has partnered with the Ministry of Agriculture and its agencies - R&D Division of MoA (MoA-R&D), Rural Agricultural Development Authority (MoA-RADA) and the Veterinary Services Division (MoA-Vet) - the European Union (EU), the Canadian International Development Agency (CIDA), ALPART Mining Venture (ALPARTMINES) and the Goat Breeders Society of Jamaica (GBSJ) to develop the goat industry. In the early 1990s, with funding from EDF of the EU and CIDA, and within an enabling environment of Government policy support for the industry, CARDI partnered with MoA-R&D, MoA-RADA and MoA-Vet to develop and transfer housing, breeding, feeding and production technologies. The alliance, in collaboration with farmers, established the GBSJ, which subsequently spearheaded breed improvements and quality control, innovation and farmer education. Further financial input from ALPARTMINES in the late 1990s, and collaboration and synergy with their farmers' groups resulted in the establishment of the Sam Motta Goat Demonstration and Training Centre. This partnership of enabling environment, resource provision and investment, technical know-how, technology development and capacity building, and technology dissemination, and uptake and assimilation resulted in: (1) increased investments in goat farming, including 650 pedigree stock imported by farmers at a cost of US\$1.1M, (2) increased productivity in liveweight at birth (66.2%), weaning (47.9%), and 8-10 months of age (85.9%), and increased doe productivity index (72.4%), (3) more than 100 per cent increase each in the number of farm families earning part of their living from small ruminant production (from 27,000 to 59,600), the population of small ruminants (from 206,000 to 416,500) and local small ruminant meat production (from 618 to 1,375 MT), (4) stimulation of interest and involvement of corporate Jamaica in the small ruminant industry through the provision of dedicated small ruminant feeds and small ruminant veterinary products and tools.

INTRODUCTION

The Caribbean Agricultural Research and Development Institute (CARDI) is the premier agricultural research and development organisation in the English-speaking Caribbean established in 1975 with the mission to enhance the socioeconomic well-being of Caribbean people through research that improves the competitiveness and sustainability of regional agriculture. The Institute places great emphasis on partnership and linkages in the conceptualisation, planning and execution of its programmes and the subsequent dissemination and application of the results. This paper highlights the application of the partnering philosophy by the CARDI in the development of the small ruminant industry in Jamaica.

Goats and sheep are believed to have been introduced to Jamaica in the 15th and 16th centuries by the Spaniards and the Portuguese (Oliveira and Thompson, 1988) possibly through Africa and India (Muschette and Miller, 1988). Since then, small ruminants, especially goats have become a way of life and important socio-economic activity in Jamaica. Research and development efforts began in the 1950s and 1960s with sheep, but it was not until the 1980s that greater attention started to be paid to goats. During 1987-1990 the Ministry of Agriculture executed a Government of Jamaica/European Union (then EEC) bilateral project funded by the European Union. The project trained producers to make cheese and leather craft, established revolving schemes for foundation stock and prophylactic medication, and initiated the formation of goat farmers' groups.

The involvement of CARDI in the development of the small ruminant industry began in the 1980s with a series of nutritional studies (Johnson 1983) but from the early 1990s it began partnering with the Ministry of Agriculture and its agencies, as well as donor agencies for a more focused development effort for the industry.

METHODOLOGY

Partners

The partners whose contributions form the basis of this paper and their respective roles are as follows:

- ALPART Mining Venture (ALPARTMINES): Donor agency and participant in technology validation and uptake.
- Caribbean Agricultural Research and Development Institute (CARDI): Technical know-how, technology development and dissemination and capacity building.
- Canadian International Development Agency (CIDA): Donor agency.
- European Union (EU): Donor agency.
- Goat Breeders Society of Jamaica: Investors, participants in technology generation, validation, dissemination, uptake and assimilation.
- Ministry of Agriculture (MoA): Policy and enabling environment.
- MoA – Research & Development (MoA-R&D): Technical know-how, technology development and dissemination and capacity building.
- MoA – Rural Agricultural Development Authority (MoA-RADA): Technology dissemination.
- MoA – Veterinary Services Division (MoA-Vet): Technical know-how and support services.

Partnership at work

CARDI-MoA-EU

CARDI formally started research for the development of the small ruminant industry in Jamaica in 1991 following the launching in 1990 of the Jamaica component of the CARDI/Technology Transfer & Applied Research Project (TTARP) which was funded by the European Development Fund of the EU (the then EEC) under the EU/EDF-Lome III Agreement. The objective of the project was to facilitate “mutton” import substitution and enhanced farmer

income from improved goat productivity through the provision of improved breeding stock, and the application of improved feeding and management practices. The executing agencies were CARDI, MoA-R&D and MoA-RADA. The project was supervised and monitored by a Project Advisory Committee that comprised 14 members, 9 from the MoA, 3 from CARDI and 2 goat producers. Thus, although CARDI negotiated the TTARP the Sheep and Goat Development component was executed in Jamaica as national project for the benefit of Jamaican goat producers.

The project lasted up to 1997 and during that period we conducted ex-ante analysis to identify the constraints of the small ruminant industry and then developed and/or adapted appropriate technologies to address them. The major constraints identified were:

- Housing (lack of it; use of expensive materials)
- Breeding stock (mainly native goats with low productivity; insufficient numbers of breeding females)
- Feeds and feeding (limited use of forages; high dependence on commercial concentrate feed)
- Husbandry and production practices (lack of identification; absence of record keeping; long breeding intervals; emphasis on costly curative health management)

The technologies developed and/or adapted were as follows:

- **Housing:** We designed and constructed prototypes of improved housing solutions. The principal characteristics of the housing solutions were that they were constructed of local materials, raised off the ground and with slatted floor to promote sanitation and good health.
- **Breeding stock:** Forty-four (36 does and eight bucks) Anglo-Nubian goats were imported and put in breeding schemes to produce purebreds and crossbreds (with native goats) for small farmer breeders and other producers.
- **Feeds and feeding and production systems:** We developed improved forage systems based on multi-purpose trees, fodder and forage grasses and trailing legumes. We also developed rations from agro and industrial byproducts, which were comparable in animal productivity with the commercial concentrate feeds but at a lower cost. The forages and by-products feeds were used to develop three production systems – forage only, forage and by-product feed supplementation and by-product feeds feedlot.
- **Husbandry practices:** Animal identification systems and record keeping were introduced. Prophylactic health management was emphasized and management system was introduced to facilitate at most ten months breeding intervals.

Transfer of technologies

The developed and/or adapted technologies were packaged as modules and transferred to our clientele. The transfer mechanisms used included direct on-farm participatory research and demonstration, field days and training sessions using developed information products, involvement of schools, farmers' groups and the outreach efforts of these groups.

CARDI-MoA-CIDA

In 1993/94 while CARDI/EU TTARP was in progress CIDA funded a project for an islandwide survey and serological tests to determine the prevalence of caprine arthritis encephalitis (CAE) in Jamaica. In 1983 a consignment of dairy goats was imported into Jamaica from Canada. Some of the animals were subsequently diagnosed with CAE, at which time some animals had been sold as breeding stock to producers. Thus, there was concern that CAE had become endemic in the local goat population and, hence, the execution of the project. The results of the study, however, showed that there were only isolated cases of the disease in Jamaica. The project was executed by CARDI and MoA-Vet.

CARDI-MoA-Farmers

The alliance of CARDI, MoA-R&D and MoA-RADA, in collaboration with farmers and other stakeholders in the industry, established in 1997 the Goat Breeders Society of Jamaica and the accompanying Herd Book for the registration of pedigree stock and the maintenance of quality and integrity of the breeds. The Society subsequently spearheaded breed improvements and quality control, innovation and farmer education.

CARDI-ALPARTMINES

In 1998 we established the Sam Motta Goat Demonstration and Training Centre with the financial input from ALPARTMINES, and collaboration and synergy with their farmers' groups. The main focus of the Centre is the production of improved breeding stock. It also serves to develop and demonstrate sheep and goats, and crops production technologies on reclaimed bauxite lands, as well as train producers in the use of the technologies.

RESULTS

The convergence of enabling environment, resource provision, technical know-how, technology development and capacity building, and technology dissemination, and uptake and assimilation by producers has enabled CARDI and its partners to contribute substantially to the development of the small ruminant industry in Jamaica. The key accomplishments during the decade of partnership for the development of the small ruminant industry are highlighted below.

Increased investments in goat farming: During the decade, producers invested, from their own resources, US\$1.1M to import some 650 pedigree stocks of goats (Nubian, Alpine and Boer) and sheep (Dorset, Katahdin, and Dorper) for breeding and foundation herds/flocks. More than 20,000 pedigree and upgraded native breeding goats were produced and distributed islandwide. Ten sheep and goat farmers' associations were formed and five schools got involved in small ruminant projects.

Increased farm-level productivity: At the farm level there was increased productivity in liveweight at birth (66.2%), weaning (47.9%), and 8-10 months of age (85.9%), and increased doe productivity index (72.4%, Table 1). The increased productivity translated to tangible benefits as exemplified by the uses of the income from small ruminant production (Table 2).

Increased national-level productivity: Statistics from national institutions and agencies show impressive growth during the decade of partnership. There was more than 100 per cent

increase each in the number of farm families earning part of their living from small ruminant production (from 27,000 to 59,600), the population of small ruminants (from 206,000 to 416,500) and national small ruminant meat production (from 618 to 1,375 MT, Table 3).

Corporate involvement in the small ruminant industry: The expansion in the small ruminant industry stimulated the interest and involvement of corporate Jamaica in the industry. Prior to 1990 there was no commercial livestock feed manufacture producing feed for small ruminants, but in 1998 there were four feed manufacturers producing dedicated goat feed. Also, during the decade merchants began selling dedicated veterinary products and tools for small ruminants.

CONCLUSION

The paper has demonstrated the successful partnering for sustainable agricultural development through the convergence of donor resources, technical know-how, technology development and capacity building, and technology dissemination, and uptake and assimilation within an enabling environment of policy support. Partnership can, therefore, be used effectively in the development of other areas of agriculture in the region.

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Table 1. Small ruminant productivity parameters at the farm level

Parameter	1991	2000	% Increase
Weight at birth, kg	2.01	3.34	66.2
Weight at weaning, kg	11.7	17.3	47.9
Weight at 8-10 months, kg	18.4	34.2	85.9
Doe productivity index*	13.4	23.1	72.4

* Productivity index = Litter size x Prewearing survivability x Weaning weight

Table 2. Example of uses of income from small ruminant production

Uses	Number of farmers
Farm expansion	5
Home construction	4
Land acquisition	3
Motor vehicle acquisition	3
Ward higher education	2
Subsidise other business	1

Table 3. Small ruminant productivity parameters at the national level

Parameter	1990	1996 up	% Increase
Number of producers	27,000	59,600	120.7
Number of sheep and goats	206,000	416,500	102.2
National meat production, MT*	618	1,375	122.5

Data source: Ministry of Agriculture (1991), AGROCON Ltd. (1998), STATIN (1998)

* Calculated from population data using extraction rate of 30% and carcass weight of 10 kg (1990) or 11 kg (1996 up)