

# Latin America and Caribbean Regional Workshop

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## Promoting Best Practices for Conservation and Sustainable Use of Biodiversity of Global Significance in Arid and Semiarid Zones



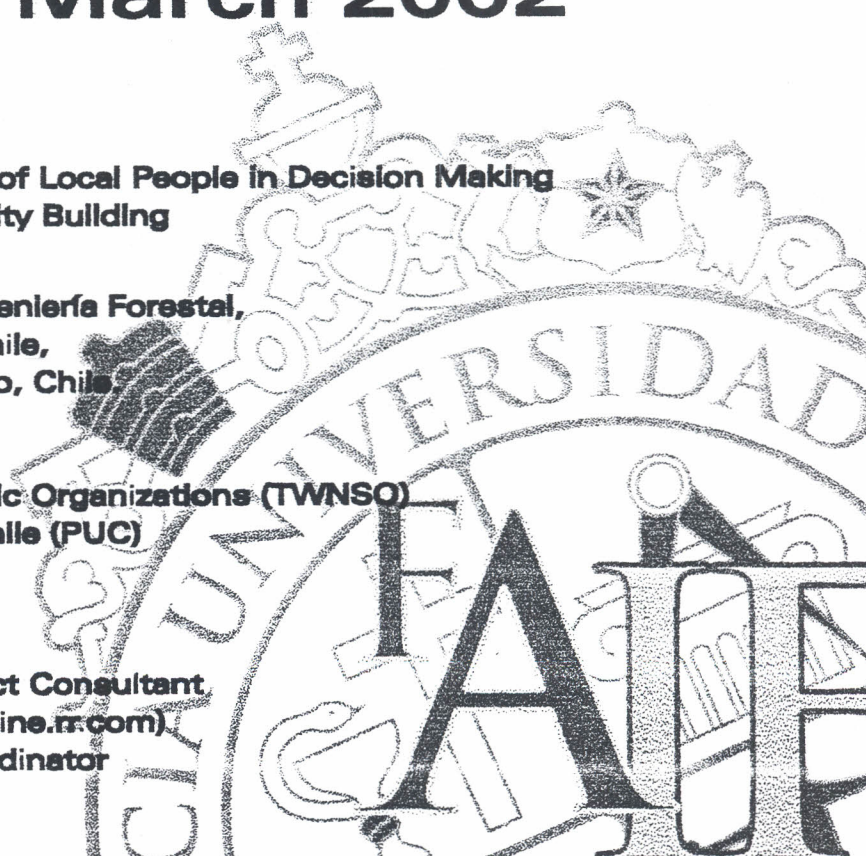
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Lessons for Sciences  
Lessons for Public Policy  
Lessons for Increasing Participation of Local People in Decision Making  
Lessons for Partnerships and Capacity Building

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## A SUSTAINABLE SYSTEM FOR ANIMAL PRODUCTION IN THE BRAZILIAN SEMI-ARID REGION

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In the semi-arid Northeast, there are about 1.0 million of farming units. Such units operate on a region characterized by heavy constraints in terms of soil and water resources. The production systems show a low technological pattern, insufficient to achieve an appropriate standard of living for the farmer, and, to avoid the continuous deterioration of the natural resources, mainly of the caatinga vegetation.

Some studies have shown that the subsistence type of agriculture today practiced, only is successful on three in every ten years, and that livestock production, by its lower vulnerability to drought effects, has constituted the main anti-migration factor in the semi-arid region. Results of a recent study conducted by Embrapa Semi-Arid workers, including small farms of 107 counties, confirmed that trend, showing a gross income increase as livestock participation in the farm activities becomes higher.

Research on livestock production in Northeast has generated a vast number of technologies, which, if adequately combined and operated, can assure, with no environmental damage, economical levels of productivity and a more equitable distribution of the benefits.

### **Basic features of the CBL system**

The caatinga-buffel-leucaena system is a technological innovation for livestock production in the semi-arid region developed by Semi-arid Agricultural Research Center (CPATSA-EMBRAPA) scientists with technical support of ORSTOM (Institut Français de Recherche Scientifique pour le Développement en Cooperation).

In its basic conception, that system embraces five fundamental features:

- It utilizes caatinga vegetation as one component - minimum of 30% of total area;

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- It utilizes drought-tolerant cultivated pastures, under a rotational system to provide with the roughage feed supply to the livestock for the rest or the year;
- It utilizes hay and silage, produced from protein/energy banks, for supplementary feeding of the animals in the most critical periods;
- It keeps a strategic reserve area with forage species of high drought tolerance, in order to assure a reasonable animal performance during subnormal years;
- It operates as a subsystem able to interact with the other components of the farm production system, within the agroecological and socioeconomical diversity of the semi- arid region.

**Technical components of the system**

The caatinga vegetation is grazed for 2 to 4 months year, as a function of the rainfall incidence in the period, when the maximum in, forage quantity and quality is available.

In the research studies carried out so far, buffel grass (*Cenchrus ciliaris*, L.) was the grass which showed the highest drought tolerance. Under the system, it is rotationally grazed for the 8 to 10 months when caatinga has little or no edible material to offer.

The legume with best performance as protein bank has been leucaena (*Leucaena leucocephala* (Lam.) de Wit.). It is cut and sun-dried ou ensiled at the first half of the green period, to be used in the dry period, and directly grazed, later, by the animals, after regrowth.

“Palma forrageira” (*Opuntia ficus-indica*, Mill) and “maniçoba” (*Manihot pseudoglaziovii* Pax&Hoffman) are the intercropped species, highly tolerant to drought, included in the system as strategic reserve area to be used in years of severe water stress, when leucaena yield is strongly affected.

Due to its high potential and versatility, the CBL system can be used for cattle, goats and sheep, or for associated systems involving two or three animal species.

Reproductive and health care procedures complement the system management.

### **Livestock performance**

Research results have shown that, under CBL system, steers can reach 420 to 450 kg liveweight at 30 to 36 months of age, as compared to the present 340 to 360 kg liveweight, at 48 to 54 months of age under the traditional caatinga extensive system.

On cow-calf operation, annual calving rates ranges from 70 to 80%, almost twice the rate observed under the traditional system.

Generally, the higher number of cows that can be raised per unit area under CBL system, associated to the higher calving rate, to a lower mortality rate, and to a higher weaning weight achieves an above 1,000% increase in the total liveweight of weaned calves/ hectare/year.

### **Economical viability**

Performance data of the system indicate its feasibility to obtain internal rates of return (IRR) ranging from 8 to 16%, as function of the operation type (cow-calf operation, steers fattening, etc.) and of the edafo-climatic potential of the area where the it is located.

### **Sustained Use Of Caatinga For Animal Production**

The CBL system incorporates a set of management procedures to assure a present and a future utilization of caatinga resources. By taking advantage of the caatinga's strong natural recovering capacity, these procedures are able to reverse the deterioration process which has reached, at low to high intensity, almost 20 million of hectares.

These procedures include:

- proper stocking rate - caatinga is submitted to a moderate grazing intensity, from 60 to 120 days/year, avoiding excessive defoliation and permitting accumulation of organic material necessary to a better recomposition and an improved forage supply in the next rainy season;
- seasonal grazing - annually caatinga begins to be grazed only after most of the desirable forage plants have flowered and set seeds, preventing caatinga from major changes in botanical composition;
- flexible stocking rate - grazing pressure on caatinga may vary year-to-year, as influenced by oscillation in rainfall rates, which constitutes the main determining factor in the amount of caatinga forage supply;
- supplementary grazing areas - rotational grazing on buffel grass pastures for the rest of the year, in order to alleviate grazing pressure on

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caatinga and to permit the long rest period ( 8 to 10 months/year) it is submitted;

•supplementary energy-protein feeding during the dry period - This is provided in order to alleviate grazing pressure on buffel grass paddocks during such period and to maintain a profitable level of animal performance.

### **Potential Areas For Cbl Systems**

A preliminary survey carried out by CPATSA scientists has identified about 40 million of hectares as showing favourable edafo-climatic and socio-economical conditions to CBL system operations. That corresponds to 42% of total semi-arid area. In these areas, with an average annual rainfall ranging from 500 to 800mm, the prevailing soil types are eutrofic and distrofic podzols, non-calcic browns, distrofic latossols and regossols.

### **Public Policy Actions**

Governments from Brazil and Japan signed the agreement for implementation of Projeto Caatinga, a protocol of environmental conservation to promote the invigoration of the productive infrastructure seeking the maintainable development of the livestock production in the areas of located caatinga in San Francisco river basin. The agreement foresees the creation, by Northeast Bank of a special line of credit, in the initial amount of US\$ 78 million, to be destined to the financing of the implantação of animal-based, production system, CBL denominated systems, in productive units in states of Bahia, Pernambuco, Alagoas and Sergipe.

The financial operations are destined to producing areas of 50 to 200 hectares, embracing, mainly, implementation of drought tolerant pastures, acquisition of animals and access to water sources. It hopes to implant about 200.000 hectares with the system, benefitting 2.000 producers in, 110 municipal counties. Farmers with areas smaller than 50 hectares can have access to the program since organized in associations, condominiums or cooperatives.

The Project is originated from an initiative of the San Francisco Valley Development Organization - CODEVASF, and presents socioeconomic objectives (men's fixation in the field, through jobs generation and of income increase) and environmental (to guarantee the handling of the caatinga in maintainable bases, reverting the current process of degradation).