

## INTEGRATED SYSTEM OF BUFALLOES RAISING ON THE SMALL FARM IN EASTERN AMAZON

<sup>2</sup>MOURA CARVALHO, L. O. D.; <sup>1</sup>COSTA, N. A.; <sup>1</sup>LOURENÇO-JÚNIOR, J. B.; <sup>1</sup>TEIXEIRA-NETO, J. F.; <sup>3</sup>SANTOS, N. F. A.; <sup>3</sup>MONTEIRO, E. M. M.

<sup>1</sup>Researches of Embrapa Eastern Amazon. P. Box, 48. CEP 66.095-100  
Belem, Para State, Brazil – E-mail: [norton@cpatu.embrapa.br](mailto:norton@cpatu.embrapa.br).

<sup>2</sup>Agronomist Travessa Serzedelo Corrêa, Edifício Manoel Pinto da Silva,  
Aptº. 1104. Belém, Pará State, Brazil. CEP 66.0000.

<sup>3</sup>Grant holders PIBIC/CNPq/Embrapa.

### ABSTRACT

This is a system of buffaloes raising, in 25 ha, for communities of small farmers, allowing the diversification of the agriculture activities, avoiding the rural exodus, the environmental impacts of cash crops farming and the destruction of the forest, besides the agrarian conflicts. Are present the costs of investments and maintenance for 10 ha of pastures, viewing the management of twenty cows, one bull and seventeen calves, as also show the revenue of the commercialization of milk and animals, with and without home land labor, with monthly net income superior in about 145% (US\$ 103.63 vs. US\$ 253.45).

**Key words:** Pasture, technology, small farms, Amazon region

### INTRODUCTION

In the Brazilian Eastern Amazon agriculture is done in small farms that utilize the traditional system of turning down and the burning the forest, to plant cassava, bean, corn and rice. There are communities of small farmers looking for technologies alternatives, most of the times not based on regional research, generate technologic, economic and ecologic problems. Buffaloes have been studied as alternative for meat, milk and work production, on the tropical conditions of the Amazon region (2). These research had been realized on exclusive condition of pasture on supplement feeding. Has been indicated buffaloes raising system on intensive rotationed grazing, technology generated by Embrapa Eastern Amazon, to recovered altered areas by inadequate management and degraded pasture (1, 3). The implantation of these integrated systems of production of buffaloes, swine, poultry, fish and agriculture, in lots of 25 ha, in communities of small farmers, will allow the diversification and capitalization of the agriculture activities in the Brazilian Eastern Amazon, avoiding the rural exodus the environmental impacts of cash crop agriculture and by the destruction of the forest, and agrarian conflicts.

### Preconized Tecnology

It module may have 25 ha, located near to rural settlement or in altered areas by turning down of the forest. May be reserved three hectares for vegetation rings, viewing the protection of water fount leads (springs, rives, creeks, lakes, dams, etc.), that came be the existents or planting african mahogany (*Kaya ivorensis*) or indian nim (*Azadirachta indica*). The farming of buffaloes, swine, poultry and fish will take one hectare to construct the installation for feeding and management of the buffaloes (born, corrals and dam). May be acquired twenty cows and one bull of the Murrah or Mediterranean races, to be raised in intensive rotationed grazing system, in area of ten hectares with gramineous of the species of *Brachiaria* (quicuí-da-amazônia e braquiarião), *Panicum* (tobiatã, tanzania e mombaça) e *Cynodon* (star grass, tifton 85 e coast cross). It is suggest the application per hectare/year, of 80 to 100 kg of nitrogen, 50 to 80 kg of phosphorus and 60 to 80 kg of potassium, depending the forage utilized, the pasture pressure and the deficiency of the elements on the soil. Phosphorus may be applied in the begging rainy season, at once, the nitrogen and potassium will be parceled in two application on the year, one in the begging and the other at the end of the rainy season. May be planted tropical fruits trees diversified vegetable and cash crops (rise, corn, bean and cassava), to feed the family and sustentable used of the land, for supplementary feeding of the milking, cows and its calves may be used the crops residues, that can also be used for the others animals of the system. Mineral salt, vaccine, medicines and fertilizes, may be acquired on the local market. The milk produced can be part sold and part to feed the family.

The manure will be utilized as fertilizer. The male buffaloes will be sold for fattening. The excedent females will also be sold to form new nucleus. It is important that these modules have training and technical assistance to implant and to attend these integrated systems of farming. It is necessary a selection of the communities that may have conditions the development the planed activities, granting its multiplied effects, through the demonstration of the model for others communities that may wish to raise buffaloes. The use of the technology in settlements on organized agricomunities can be supported by financial forces for investment and maintenance, encouraged by governmental institutions or by not governmental organizes. On this cases, may be constructed installations for transformation of the milk in to derivates (cheese, butter, sweet milk, yogurt, etc.), to process the milk production of the land, with better economical income and better commercialization.

### Productive Index

On Table 1 are the productivity index that may reached on the production system, with the use of technologies generate by agriculture research.

**Table 1** - Productive index module of 10 ha, on intensive rotationed grazing system.

Parameter	Index
Support capacity on cultivated pasture	2,5 - 3,0 U.A./ha/year
Natality	86 %
Mortality calves	2 %
Mortality adults	1 %
Discard	10%
Weight at weaning	240 kg
Milk production/300 days	1.200 kg

### Characteristics of the Production System

On Tables 2 and 3 are discriminated the operations and values of investment of maintenance costs to implanted a ten hectare module, with intensive rotationed system to manage twenty cows, one bull and seventeen calves until weaning.

**Table 2** - Investment to implant a 10 ha module of rotationed intensive pasture to manage 20 cows, 1 bull and 17 calves until weaning.

OPERATION	UNITY	QUANTITY	VALUE (US\$1.00)
<b>RECUPERATION OF DEGRADED AREA</b>			
CLEANING/PILING	TRACTOR/HOUR	40	654.55
PLOWING	TRACTOR/HOUR	25	136.36
HARROW/LEVELING	TRACTOR/HOUR	40	218.18
SUBTOTAL	-	-	1,009.09
<b>ACQUIREMENT AND SEEDS</b>			
PLANTING			
SEED WITH 32 % OF CULTURAL			58.18
VALUE	KG	100	
SEED WITH 32 % OF CULTURAL			27.27
VALUE	TRACTOR/HOUR	5	
SUBTOTAL			85.45
<b>CONSTRUCTION OF RURAL</b>			
<b>INSTALLATION</b>			
CONVENTIONAL PERIPHERAL FENCE	METER	800	581.82
ELECTRIC FENCE FOR DIVISION OF			174.55
PADDOCK	KM	1,2	
TROUGH	UNITY	1	36.36
DRINKING VESSEL	UNITY	1	72.73
MILKING ROOM AND DEPOSIT (90 M <sup>2</sup> )	UNITY	1	3,272.73
SUBTOTAL	-	-	4,138.18
<b>ANIMAL ACQUIREMENT</b>			
COW	UNITY	20	4,363.64
REPRODUCER	UNITY	1	363.64

<b>SUBTOTAL</b>	-	-	<b>4,727.27</b>
<b>AREA ACQUIREMENT</b>			
<b>DEGRADED AREA</b>	<b>HA</b>	<b>25</b>	<b>909.09</b>
<b>SUBTOTAL</b>			<b>909.09</b>
<b>TOTAL INVESTMENT</b>			<b>10,869.09</b>

US\$1.00 = R\$ 2,75.

**Table 3** - Maintenance costs of a 10 ha module of intensive rotationed grazing to manage 20 cows, 1 bull and 17 calves until weaning.

<b>OPERATION</b>	<b>UNITY</b>	<b>QUANTITY</b>	<b>VALUE (US\$1,00)</b>
<b>ACQUIREMENT AND APPLICATION OF FERTILIZER</b>			
<b>REACTIVE PHOSPHATE OF ARAD</b>	<b>KG/10 HA</b>	<b>2,000</b>	<b>218.20</b>
<b>N:P:K (30:00:20)</b>	<b>KG/10 HA</b>	<b>2,000</b>	<b>338.18</b>
<b>REACTIVE PHOSPHATE OF ARAD</b>	<b>MAN/DAY</b>	<b>5</b>	<b>20.00</b>
<b>N:P:K (30:00:20)</b>	<b>MAN/DAY</b>	<b>5</b>	<b>20.00</b>
<b>SUBTOTAL</b>			<b>596.36</b>
<b>PASTURE CLEANNESS</b>			
<b>CLEANING OF "JUQUIRA"</b>	<b>MAN/DAY</b>	<b>10</b>	<b>39.63</b>
<b>SUBTOTAL</b>	-	-	<b>39.63</b>
<b>HERD MAINTENANCE</b>			
<b>MINERAL</b>	<b>BAG</b>	<b>29</b>	<b>210.90</b>
<b>FOOT AND MOUTH DISEASE</b>			<b>16.36</b>
<b>VACCINE</b>	<b>DOSE</b>	<b>60</b>	
<b>BRUCELOSIS VACCINE</b>	<b>DOSE</b>	<b>15</b>	<b>9.45</b>
<b>VERMIFUGE</b>	<b>ML</b>	<b>500</b>	<b>27.27</b>
<b>SUBTOTAL</b>	-	-	<b>256.72</b>
<b>WORKER</b>			
<b>MILKING MAN</b>	<b>MAN/DAY</b>	<b>1</b>	<b>1,446.54</b>
<b>SUBTOTAL</b>	-	-	<b>1,446.54</b>
<b>TOTAL</b>			<b>2,339.63</b>

US\$1.00 = R\$ 2,75.

### Commercialization

The income of the commercialization of the excedent animals is shown on Table 4.

**Table 4** - Annual income of the commercialization of milk and excedent animals.

<b>Product</b>	<b>Unity</b>	<b>Quantity</b>	<b>Income (US\$1,00)</b>
<b>Milk</b>	<b>liter</b>	<b>20.400</b>	<b>3,709.09</b>
<b>Calf for fattening</b>	<b>animal</b>	<b>8</b>	<b>768.00</b>
<b>Female for reproduction</b>	<b>animal</b>	<b>5</b>	<b>480.00</b>
<b>Cow to discard</b>	<b>animal</b>	<b>2</b>	<b>363.63</b>
<b>Gross income</b>	-	-	<b>5,320.72</b>
<b>Maintenance cost</b>	-	-	<b>2,339.63</b>
<b>Financial cost investment (6% for year)</b>	-	-	<b>652.36</b>
<b>Amortization (10% for year)</b>	-	-	<b>1,086.90</b>
<b>Net income</b>	-	-	<b>1,241.81</b>
<b>Net income/month</b>	-	-	<b>103.63</b>

US\$1.00 = R\$ 2,75.

The average milk production is 4 kg/cow/day, during 300 days of lactation. The selling of the males, after weaning for fattening, will be of eight animals weighting 240 kg. The five females will

be sold for reproduction, while the two cows of discard will be sold for slaughter. On Tables 5, 6 and 7 are present operations and value of investment and maintenance costs to implant a module of a ten hectares with intensive rotationed grazing system to manage twenty cows, one bull and seventeen calves until weaning, as also detach the income of the system, with home land labor, what represent a monthly net revenue superior around 145% (US\$ 103.63 vs. US\$ 253.45).

**Table 5** - Investment to implant a 10 ha module of intensive rotationed grazing with 20 cows, 1 bull and 17 calves until weaning, using home labor.

Operation	Unity	Quantity	Value (US\$1,00)
Recuperation of degraded area			
To make the area arable	Hectare	10	-
Acquirement and seeds planting			
Seed with 32 % of cultural value	Kg	100	58.18
Seed with 32 % of cultural value	-	-	-
Subtotal			58.18
Construction of rural installation			
Conventional peripheral fence	M	800	465.45
Electric fence for division of paddock	Km	1,2	130.90
Trough	Unit	1	29.09
Drinking vessel	Unit	1	58.18
Milking room and deposit (90 m <sup>2</sup> )	Unit	1	2,781.81
Subtotal	-	-	3,465.45
Animals Acquirement			
Cow	Unit	20	4,363.63
Reproducer	Unit	1	363.63
Subtotal	-	-	4,727.27
Area acquirement			
Degraded area	Ha	25	909.09
Subtotal			909.09
Total investment			9,160.00

US\$1.00 = R\$ 2,75.

**Table 6** - Costs to maintain a 10 ha module of intensive rotationed grazing in degraded area to manage 20 cows, 1 bull and 17 calves until weaning, using home labor.

Operation	Unity	Quantity	Value (US\$1,00)
Acquirement and application of fertilizer			
Reactive phosphate of Arad	kg/10 ha	2.000	218.18
N:P:K (30:00:20)	kg/10 ha	2.000	338.18
Subtotal			556.36
Herd maintenance			
Mineral	Bag	29	210.90
Foot and mouth disease vaccine	Dose	60	9.45
Brucelosis vaccine	Dose	15	9.45
Vermifuge	MI	500	27.27
Sub-Total	-	-	256.72
Total			813.09

US\$1.00 = R\$ 2,75.

**Table 7** - Annual revenue of the commercialization of milk and excedent animals in a 10 ha module of intensive rotationed grazing in degraded area managing 20 cows, 1 bull and 17 calves until weaning, using home labor.

Product	Unity	Quantity	Revenue (US\$1,00)
Milk	liter	20.400	3,709.09

Calf for fattening	animal	8	768.00
Female for reproduction	animal	5	480.00
Cow to discard	animal	2	363.63
Gross income	-	-	5,320.72
Maintenance cost	-	-	813.09
Financial cost on investment (6% for year)	-	-	549.81
Amortization (10% for year)	-	-	916.00
Net income	-	-	3,041.81
Net income/month	-	-	253.45

US\$1.00 = R\$ 2,75.

## REFERENCES

- (1) COSTA, N.A.; MOURA CARVALHO, L.O.D.; TEIXEIRA, L.B.; SIMÃO NETO, M. Eds. (2000). **Pastagens cultivadas na Amazônia**. Belém: Embrapa Amazônia Oriental, 151 p.
- (2) NASCIMENTO, C.; MOURA CARVALHO, L.O.D. (1993). **Criação de búfalos: alimentação, manejo, melhoramento e instalações**. Brasília: Embrapa - SPI, 403 p.
- (3) SARMENTO, C.M.B. (1999). Avaliação de pastagens de quicuio-da-amazônia (*Brachiaria humidicola* (RENDLE) Schweickhardt) e de tobiatã (*Panicum maximum*, BRA 001503) em sistema de pastejo rotacionado intensivo. Belém: UFPa, 95 p. **Dissertação Mestrado**.