

TRIP REPORT TO "AGRESTE" REGION OF

NORTHEAST BRAZIL \*

by

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02399

1. INTRODUCTION

Dr. Renival, Chief CPATSA, Petrolina, suggested, that Agreste region of Northeast Brazil makes maximum utilization of draft animal for agricultural operations. With this point in view, Mr. Péricles F. Nunes and myself made a trip by car to some parts of Agreste region to study the present status of mechanization. The itinerary along with the organizations visited during the trip is enclosed in Appendix A.

As it was my first visit to the region and time available was limited the major emphasis was laid to visit state and federal research and extension agencies and some farmers' fields to collect information about the equipment they are using with animal power mainly and to know their opinion about the performance of these equipment. The utmost care was taken while collecting information about the performance because if farmer has not used variety of equipment for similar operations, it is difficult to rate the performance, in isolation, of an individual equipment.

The excellent cooperation of researchers, extension workers, farmers and the administrators of various organisations visited during the trip needs my appreciations. I am grateful to them, because it would not have been possible to achieve the objective of the mission without the cooperation of the persons listed in appendix B, and many others representing different organisations.

2. OBSERVATIONS AND DISCUSSIONS

It was really interesting to see three distinct categories of farmers using different source of power. At this stage, it is difficult for me to categorise these farmers on regional basis but I would like to present some thoughts about them with the help of individual cases.

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\* An informal report for limited circulation

\*\* Consultant, Agricultural Mechanization to CPATSA/EMBRAPA/IICA

ACKNOWLEDGEMENT - Mr. Péricles F. Nunes who accompanied me on the trip needs my deep hearted thanks for the excellent cooperation and help he extended during journey and translating portuguese to english and vice-versa.

## 2.1 FARMERS WITH SMALL LAND HOLDINGS AND USING HAND TOOLS AND MANUAL POWER

- a) Name of the farmer - Antonio Xavier
- b) Location - Aquidabã<sup>1</sup> - SE.
- c) Land holding - 0.6 hectare
- d) Cultivated area <sup>2</sup> - 0.2 hectare
- e) Grass land - 0.4 hectare
- f) Number of animals owned - Nil
- g) Approximate gross returns from grass land - Cr\$ 800/year
- h) Approximate gross returns from cropped land - Cr\$ 7.800/year
- i) Implement used<sup>3</sup>
  1. Enxada 2 libras
  2. Enxadeco
  3. Machado
  4. Peixeira
  5. Foice.

## 2.2 FARMERS WITH MEDIUM LAND HOLDING AND USING ANIMAL TRACTION

- A.
- a) Name - Pedro Lima de Souza
  - b) Location - Aquidabã - SE.
  - c) Land holding - 2 hectare
  - d) Cultivated area - 2 hectare
  - e) Number of animals - 1 mule
  - f) Implment available<sup>4</sup>
    1. Wooden spike tooth harrow
    2. Right hand mould board plow
    3. Five tine cultivator
    4. Planter cum fertilizér applicator<sup>5</sup>
    5. Knap sack sprayer
    6. 1/2 salamin<sup>6</sup>
  - g) Number of years of use of these equipment<sup>7</sup> - 2 years
  - h) Total area cultivated with these equipment - 15 hectare
  - i) Mode of lending the equipment - Exchange basis.

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1. Some general observations about Aquidabã region are given in appendix C
  2. According to farmer's wife, who was interviewed it is not possible to cultivate the complete area because of the restricted available equipment.
  3. All these are hand tools and are used for various operations to grow crops.
  4. Technical details available with the author.
  5. Adapted locally with the technical guidance from EMATER - Aquidabã.
  6. A local volumetric measure to weigh grains (size 25 x 25 x 15 cm).
  7. Prior to purchase of these equipment farmer was using hand tools mainly and with the inspiration from EMATER - Aquidabã he has adopted animal drawn equipment.

- B.
- a) Name of the farmer - Sitio Mimosinho
  - b) Location - Garanhuns - PE.\*
  - c) Land holding - 24 hectare
  - d) Cultivated area - 5 hectare
  - e) Number of animals\*\* - 16
    1. Ballocks - 10
    2. Cow - 6
  - f) Grass land and natural vegetation - 19 hectare
  - g) Bullocks used as draught cattle - 4
  - h) Implement available \*\*\*
    1. single tine cultivator \*\*\*\*
    2. Reversible mould board plow
    3. Planter.
  - i) Number of years the implements have in use - 12

### 2.3 FARMERS WITH LARGE LAND HOLDINGS AND USING MECHANICAL POWER

Although Northeast Brazil is characterised as a region with the farmers, who have low land holdings with limited resources, but there is a large percentage (30, 26%) of total cultivable area owned by big farmers constituting 0,3% of the total establishments. Table 1. clearly reveals this fact and also shows that 70% of total establishments are of small farmers (0-10 hectare) and have only 5.41% of the total cultivable area. To study the present status of mechanization of big farmers, a commercial establishment, with following particulars, in Maceió, was visited.

1. Name of establishment - Usina Central Leão
2. Name of the owner - Mr. S.A. Leão Irmãos
3. Total area - 42.000 hectare
4. Cultivated area - 15.000 hectare
5. Extent of mechanization - Total
6. Extent of irrigation - 20%
7. Main production items - sugarcane and acohol

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\* Some general observations about Garanhuns (PE), region in given appendix D.

\*\* A good pair draught animal costs Cr\$ 40.000,

\*\*\* Technical details available with the author.

\*\*\*\* A single right hand mould board plow is available with this unit.

Table 1. - Categories of farmers, their area and number of establishments

CATEGORIES	AREA (ha)	NUMBER OF ESTABLISHMENTS	AVERAGE HOLDING OF THE CATEGORY (ha).
0 - 10 ha	4,321,691(5.41)*	1,651,325(70.00)	2.62
10 - 100 ha	18,180,969(22.78)	567,064(24.01)	32.06
100 - 1000 ha	33,163,859(42.00)	130,850(5.54)	253.45
Above 1000ha	24,114,526(30.26)	92,34.(0.30)	2,611.49
TOTAL	79,780,768 (100)	2,361,047 (100)	-

Source - Anuário Estatístico do Brasil - 1978  
Rio de Janeiro, IBGE, 1961, Page 331.

\* Figures in the bracket indicate the percentage

## 8. Macninery Available

- a) Tractor Cat D7 - 09
- b) Tractor Cat D6 - 06
- c) Tractor Cat D4 - 08
- d) Tracotr MF 95 - 20
- e) Tractor MF 65 - 06
- f) Cane harvesters 70 FHI - 06
- g) Tractor CBT-2400 - 06
- i) Sugarcane Carriers CAT 966 - 02
- j) Sugarcane Carriers CB7 - 15

This farm is suppose to be fourth biggest farm of the Brazil and is managed by a Director, two superintendents, seven managers and about 450 field and worshop regular staff with the seasonal employment potential for over 2000 labours during critical operations. I was told that there are about 7 farmers with land holding 7.500 - 15.000 hectares and about 20 farmers with land holding of 1.000 - 7.500 hectares and about 6.000 farmers with land holding 50 ha to 1000 hectares.

### 3.1 Possibility of Development and popularise animal drawn equipment

The available animal drawn equipment are restricted to only Garanhuns (PE) regions and while in other regions such as Aquidabã (SE) it is only for last two years, that local extension agency "EMATER" is trying to introduce and popularise these equipment. The main implements of the region are mould board plow, spike tooth harrow and hand or animal drawn planter. All these implements are on separate chassis which increase the cost of total machinery package. The horse cart available in these regions is made of woods and have very low loading capacity. The new concept of multi-tool carrier, being tested by various international agencies such as ICRISAT, Hyderabad (india), National Institute of Agricultural Engineering, Silsoe, U.K., and Botswana Agricultural Research Centre, Botswana, has various advantages in terms of low cost, comforts for operator and better work performance. This need to be developed and tested for Brazilian SAT farmer.

### 3.2 On going Research Projects at Various Centres

During the trip I had the opportunity to witness various on going research projects at different locations. The experiments which impressed me most are:

1. Evaluation of various soil and crop management systems for soil and water conservation.
2. Evaluation of crop response to different tillage implements.

Both of these experiments are located IPA Serra Talhada, Pernambuco state, under the leadership of Dr. José Nunes Filho, a soil scientist of the Centre.

Most of the soil configurations and planting techniques being tested in the experiments are presently performed either manually or using costly equipment. Sr. Nunes also requested if I could devote certain time in development of a planter which could plant in the mulched soil without performing any tillage. The similar machine has been developed and reported by IITA (International Institute of Tropical Agriculture) Nigeria.

### 3.3 Comparison of Agricultural Mechanization (Present Status) of Brazilian SAT with that of Indian SAT

I feel it would not be out of place to put some comments about comparison of mechanization of Brazilian SAT with that of Indian SAT. In both the countries there are three distinct categories of farmers, (a) small, with limited holding, (b) medium, with holding sufficient to maintain a family and (c) Large mechanized farms. The population of large mechanized farms in SAT Brazil seems to be higher than that of India. The mechanization (Tractorisation) has affected mainly, irrigated agriculture of North India and has not been able to show its impact in SAT (dry land), Indian region. It is mainly because the major crops grown in these regions are not cash crops. While in Brazil sugarcane farming has been the major user of mechanical source of power and its related equipment wherever feasible.

Another major difference is the number of years, the animal power has been in use in agriculture. In India, animal power has been popular since ages, generally all the farms of SAT regions (small or large) use animal power (traction) for most of the cultural operations. It might be really difficult to find a patch of cultivated land where animals have not walked, to do some operation or other. The equipment package available with Indian farmer using animal traction consist of mainly wooden plow, wooden harrow and wooden planter. This package is the result of farmer own experience of ages and no industry or engineering organization has ever put its resource in developing these equipment. On the contrary, a large number of small establishments in Brazil are still managed by manual labour. The concept of use of animal (power) traction is picking up and it is interesting that most of animal equipment available with farmers are manufactured and supplied by established manufacturers.

Because most of the equipment being used by Brazilian farmers are made of steel, it would be easier to popularise new equipment in this condition, as compared to Indian condition where most of the equipment presently being used are made of wood and only soil working parts are made of steel which are supplied by local blacksmiths and vary in size and shape from region to region.

#### 4.4 Future (Follow Up) Plan

1. Visit other regions of SAT Brazil to collect more information as reported in this report.

2. To visit agricultural implement manufacturers to study the manufacturing facilities for the production of improved equipment and extent of sale of the existing equipment.

3. Development of improved equipment.

Appendix A - Itinerary and List of Organization Visited

14.11.79 - SERGIPE

1. Contacto com a Sede da EMATER-SE em Aracaju
2. Contacto com o INAM - Projeto de Baixa Renda, em Aracaju
3. Contacto com o escritório da EMATER-SE em Aquidabã
4. Visita a pequenos produtores em Aquidabã
5. Visita a UEPAE-SE em Quissamã
6. Contacto com a UEPAE-SE em Aracaju

15.11.79 - FERIADO

16.11.79 - ALAGOAS

1. Contacto com a Sede da EMATER-AL em Maceió
2. Contacto com o IAA - Instituto do Açúcar e do Alcool, em Maceió
3. Visita à Usina de Açúcar e Alcool

PERNAMBUCO

17.11.79 - SÁBADO

18.11.79 - DOMINGO

19.11.79

1. Contacto com a IPA - Empresa Pernambucana de Pesquisas Agropecuárias, em Caruaru - PE.
2. Contacto com o escritório da EMATER-PE em Garanhuns - PE.
3. Visita a pequenos produtores de Garanhuns.

20.11.79

1. Contacto com a IPA - Empresa Pernambucana de Pesquisa Agropecuárias, em Serra Talhada - PE.



Appendix B - List of persons met during the trip

1. Antonio Paulo de Mendonça  
Bel. em Administração  
Assessor do Projeto Baixa Renda - INAM  
Aracaju - SE.
2. José Ricardo de Castro  
Técnico Agrícola  
EMATER-SE  
Aquidabã - SE
3. Jorge do Prado Sobral  
Engº Agrônomo - Chefe  
UEAPE - SE  
Aracaju - SE
4. Eduardo Jorge Lopes Neves  
EMATER - AL  
Av. Comendador Leão, 720  
Maceió - AL.
5. Edvan Passos Tenório  
EMATER - AL  
Maceió - AL
6. Chhatu Ram  
Fitopatologista  
IAA - Instituto do Açúcar e do Acool  
Maceió - AL.
7. José Arthur Lopes F. Filho  
Engº Agrônomo - Gerente  
Usina Central Leão S.A. - Leão Irmãos  
Maceió - AL.
8. Maria Celeste Gonçalves  
IPA - Empresa Pernambucana de Pesquisas Agropecuárias  
C.P. - 125  
Caruaru - PE.
9. José Nunes Filho  
Pesquisador Manejo de Água e solo  
IPA - Empresa Pernambucana de Pesquisas Agropecuárias.  
Serra Talhada - PE.

10. Hélio A. Burity

IPA - Empresa Pernambucana de Pesquisas Agropecuárias

Av. Gel. Yan Martin, 1371 - Bongi

RECIFE - PE.

11. Jair Texeira

Engº Agronomo

IPA - Empresa Pernambucana de Pesquisa Agropecuária

Caruaru - PE.

Appendix C - Some general observations about Aquidabã region

Rain Fall - 1000 mm.

Soil Type - Podzol

Major Crops of the region - Mandioca (Cassava)

- Maize

- Beans

Cropping Season - May to September

Local Research Extension Centre - EMATER-SE, Aquidabã

Total of number of small farmers - 200

Farmers using animal power - 80

Farmer using had tool - 100

Others - 20

Cultivated area with small farmers - 70 ha

Population of animal drawn equipment \*

(a) Planters - 4

(b) Cultivator - 10

(c) Plow - 10

(d) Spike tooth harrow

(1) Wooden - 2

(2) Iron - 1

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\* The animal drawn equipment have been popular in the region only for last two years. Mr. Schimidt São Paulo a practical agricultural engineer visited the region and inspired the local extension Centre and farmers to use animal drawn equipment.

Appendix D - Some general observations about Garanhuns region

Rain Fall - 700 mm.

Soil type - Podzol

Major Crops - Maize and Beans

Major Crops system - Inter Crop

Cropping Season - April to August

Total Number of small farmers - 1000

Extent of utilization of animal drawn equipment

(a) Reversible plow - 1000

(b) Planter - 1000

(c) Cultivator - only certain percentage (exact number available)

Prevalent hiring rate

- Plowing - Cr\$ 700/ha

- Planting - Cr\$ 150/day

- Labour - Cr\$ 80/day

Special Remark - The farmers interviewed has a reversible plow for last 20 years and has replaced plow share three times.

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The information in appendices C and D is the result of verbal conversation with farmers, research scientists and extension workers of the regions and does not have any reference to published literature.