

| No. of Working Days | Average Salary | Inputs | Own Credit | Commercialization Location | Commercialization Manner | Technical Assistance | Expenses | Organization |
|---------------------|------------------|------------|------------|----------------------------|--------------------------|----------------------|----------|--------------|
| P 290, T 60 | P 1 Sal, T 1 Sal | Seeds | - | Municipality | Middleman | No | 10700 | No |
| T 200 | 5/day | No | No | Municipality | Middleman | No | 2950 | No |
| P 220 | P 5/day | No | No | Municipality | Others | #NAME? | 5100 | No |
| P 230 | 5/day | S/N/S | Yes | Municipality | Middleman | No | 24040 | No |
| P 200/T 60 | P 5/day, T 5/day | - | - | Municipality | - | No | 4400 | No |
| 50 days | 5/day | S/F/A | No | - | - | No | 4010 | No |
| 120 | 7/day | S/A | Yes | Municipality | Middleman | No | 8000 | No |
| P 360/T 150 | P 7200, T 900 | Seeds | Yes | Municipality | Middleman | No | 3700 | No |
| - | - | - | - | - | - | - | - | - |
| 300 | 112 | S/S/N | - | State | Middleman | - | 4400 | Yes |
| 150 | 5/day | No | Yes | Municipality | Middleman | - | 2114 | No |
| P 200/T 100 | P 120, T 5 | Seeds | Yes | Municipality | Middleman | - | 2150 | Yes |
| - | - | No | No | - | - | No | 660 | No |
| 30 | 6/day | S/S/N | - | Municipality | Middleman | No | 8040 | Yes |
| 150 | 5/day | - | Yes | Municipality | Wholesaler | No | 1740 | Yes |
| - | - | - | No | Municipality | Wholesaler | No | 3180 | No |
| - | - | Fertilizer | No | Municipality | - | No | 1320 | No |
| 200 | 7/day | Seeds | No | Municipality | Others | No | 4560 | Yes |
| 90 | 8 | S/S/N | Yes | Municipality | Wholesaler | Yes | 3360 | Yes |
| - | - | S/S/N | No | State | - | No | 1110 | No |
| 10 | 5 | Fertilizer | - | Municipality | Others | - | 3240 | Yes |
| T 15 | P 150, T 7/day | Seeds | No | - | - | Yes | 9612 | Yes |
| - | 5/day | S/S/S | Yes | Country | Retailer | - | 12040 | Yes |
| T 22 | P 120, T 6 | S/S/S | Yes | Country | Retailer | Yes | 9360 | Yes |
| - | - | Fertilizer | No | - | - | No | 1560 | No |
| P 25/ T 360 | P 5 Sal, T 5/day | S/S/S | No | Country | Wholesaler | Yes | 11760 | No |
| 365 | 120 | - | No | Municipality | Wholesaler | No | 22800 | Yes |
| - | - | S/S/N | No | Municipality | Wholesaler | No | 2100 | No |
| - | - | Seeds | No | State | - | Yes | 3120 | Yes |
| 250 | 5/day | Fertilizer | No | Municipality | Wholesaler | - | 3840 | No |
| - | - | Fertilizer | No | Municipality | Wholesaler | - | 5740 | Yes |
| 10 | 7/day | - | Yes | Municipality | Retailer | No | 1080 | Yes |
| 360 | 157 | Fertilizer | Yes | Municipality | Retailer | Yes | 6000 | No |
| 60 | 5/day | S/F | Yes | Municipality | Retailer | No | 1560 | No |
| P 15/T 15 | P 5/day, T 5/day | Fertilizer | Yes | Municipality | Retailer | No | 5040 | No |
| 10 | 5/day | Seeds | No | Municipality | Retailer | No | 5520 | Yes |

Table IV - 7.1 Resume of the Rural Producers' Rural Socio-Economic Survey Questionnaires (Continued)

| Number Quest. | Municipality | Age | Origin | Arrival | Civil Status | Education | Main Activity | No. of Persons | Type of Dwelling | Type of Comb. |
|--------------------|---------------|-----|--------|---------|--------------|-----------------|----------------|----------------|---|---------------|
| 6 - J Center West | Barroilandia | 51 | GO | 1985 | Married | 1st Grade Inc. | Rural Producer | 6 | Tile/Masonry/Cement | Firewood/Gas |
| 7 - J Center West | Dois Irmãos | 35 | TO | 1972 | Married | 2nd Grade Comp. | Rural Producer | 3 | Thatched roof/Adobe/Earth floor | Firewood |
| 8 - J Center West | Abreulandia | 58 | MA | 1972 | Married | 1st Grade Comp. | Rural Producer | 7 | Tile/Adobe/Cement | Gas |
| 9 - J Center West | Marianópolis | 43 | MA | 1955 | Married | 1st Grade Inc. | Rural Producer | 5 | Tile/Masonry/Cement | Firewood |
| 10 - J Center West | Divinópolis | 41 | TO | 1977 | Married | 1st Grade Comp. | Rural Producer | 3 | Thatched roof/Adobe/Earth floor | Firewood/Gas |
| 11 - J Center West | Divinópolis | 31 | BA | 1973 | Married | 1st Grade Comp. | Rural Producer | 3 | Thatched roof/Adobe/Earth floor | Firewood |
| 12 - J Center West | Monte Santo | 44 | GO | 1987 | Married | 1st Grade Comp. | Rural Producer | 6 | Tile/Masonry/Cement | Firewood/Gas |
| 13 - J Center West | Plum | 50 | MG | 1987 | Married | 1st Grade Inc. | Rural Producer | 4 | Thatched roof/Adobe/Cement | Firewood |
| 14 - J Center West | Plum | 38 | TO | 1959 | Married | 1st Grade Inc. | Rural Producer | 3 | Tile/Masonry/Cement | Firewood/Gas |
| 15 - J Center West | Plum | 56 | TO | 1941 | Married | 1st Grade Inc. | Rural Producer | 6 | Tiles/Adobe/Cement | Firewood |
| 16 - J Center West | Pugmil | 59 | MA | 1946 | Married | 1st Grade Inc. | Rural Producer | 12 | Thatched roof/Adobe/Masonry/Earth floor | Firewood/Gas |
| 17 - J Center West | Chapada Areia | 54 | MAS | 1955 | Married | 1st Grade Inc. | Rural Producer | 9 | Thatched roof/Adobe/Cement | Firewood/Gas |
| 18 - J Center West | Paraiso | 56 | MG | 1973 | Married | 1st Grade Comp. | Rural Producer | 4 | Tile/Masonry/Cement | Firewood/Gas |
| 19 - J Center West | Paraiso | 39 | GO | 1989 | - | 1st Grade Comp. | Rural Producer | 4 | Tile/Masonry/Cement | Gas |
| 20 - J Center West | Paraiso | 43 | MG | 1971 | Married | 2nd Grade Comp. | Rural Producer | 5 | Tile/Masonry/Cement | Firewood/Gas |

LEGEND FOR DOMESTIC UTILITIES

A-Radio; B-TV; C-Video; D-Sewing Machine; E-Refrigerator; F-Oven; G-Water Purifier; H-Electric Fan; I-Air Conditioning; J-Bicycle; K-Motorcycle; L-Car; M-Truck; N-Oxcart; O-Cart

| Illumination | Sanitary Conditions | Water Source | Domestic Utilities legend at the bottom) | (see legend at the bottom) | No. and Type of Schools (Low 1st grade=L, 2nd High 1st grade=H, grade=S) | Health Conditions (p=precarious, r=regular, g=good, H=hospital, HP=health post, HA=health agent) | Land ownership |
|--------------|--|-------------------|---|-------------------------------|---|---|-------------------|
| Oil | Bathroom/Cistern/Toilet | Well/Brook/Spring | 1A1C1J1O | | 18 L, 3 H, 1 S | 1 p H, 1 r HP | Owner |
| Oil | - | Brook/Spring | 1A1C1J1O | | 2 H | 1 p H, 1 r HP | Owner |
| Gas | - | Brook/Spring | 1J | | 2 H | 1 r H, 1 r HP | Owner |
| Electricity | Bathroom/Cistern | Well/Spring | 1A1B1D1E1J | | - | 1 g H, 1 r HP | Owner |
| Oil | Cistern | Well/Brook/Spring | 1J1M1O | | 2 H, 1 S | 1 H, 1 p HP | Owner |
| Oil | Cistern | Well/Brook/Spring | 1A1J1K1L | | 2 H, 1 S | 1 p H, 1 r HP | Owner |
| Electricity | Piped water/Bath./Cistern/Cesspit/Toilet | Well/Brook/Spring | 1A1B1D1E1F1J1N1O | | 1 H, 1 S | 1 g H, 1 r HP | Owner |
| Oil | - | Brook | 1A | | - | - | Owner |
| Oil | Cistern | Well/Brook/Spring | 1F1J | | - | 1 r H, 1 r HP | Owner |
| Oil | - | Brook/Spring | 1A1L1M1O | | 1 H | 1 p HP, 1 g HA | Owner |
| Gas | Cistern | Well/Brook/Spring | 1A1C1E1J | | - | 1 g HP | Owner |
| Oil | Bathroom/Cistern/Toilet | Well/Brook/Spring | 1A1B1E1J | | 7 L, 1 H | 1 g HP | Owner |
| Electricity | Piped water/Bath./Cistern/Cesspit/Toilet | Well | 1A1B1E1F1K1J1N | | 6 H, 4 S | 1 g H, 1 g HP | Owner |
| Electricity | Piped water/Bath./Cistern/Cesspit/Toilet | Well/Brook/Spring | 1A1B1E1H1J1L1O | | 4 H, 4 S | 1 r H, 1 g HP | Owner |
| Oil | Bathroom/Cesspit/Toilet | Brook | 1A1J1O | | 6 H, 4 S | 1 g H, 1 g HP | Owner |

| Total Area | Cultivated Area | Annual Crop | Perennial Crop | Pasture | Soil Preparation | Agricultural Devices | Productive Structure | No. of Workers (Temporary=T, Permanent=P) |
|------------|-----------------|-------------|----------------|---------|------------------|-------------------------------------|-------------------------|---|
| 44 | 4 | 4 | 0 | 0 | Slash and Burn | Mower/Oxcart/Matraca/Hoe | Storehouse | P 1 |
| 284 | 145 | 27 | 0 | 145 | Slash and Burn | Weed harrow/Matraca/Ax/Reaping hook | Storehouse/Corral | P 1 |
| 120 | 23 | 5 | 3 | 15 | Slash and Burn | Hoe/Reaping hook/Matraca | Corral | T 1 |
| 112 | 80 | 12.5 | 0 | 67 | Slash and Burn | Hoe/Reaping hook/Matraca/Big hoe | Storehouse/Corral | T 2 |
| 110 | 110 | 12 | 0 | 98 | Slash and Burn | Hoe/Reaping hook/Matraca | Storehouse/Corral | P 1 |
| 216 | 35 | 0 | 0 | 35 | Slash and Burn | Hoe/Matraca/Handspike | Corral/Others | P 1/T 3 |
| 271 | 252 | 16 | 0 | 242 | Tractor | CBT/Plow/Need harrow/Planter | Storehouse/corral/Sheed | T 2 |
| 43.5 | 41 | 7 | 0 | 34 | Slash and Burn | Hoe/Reaping hook/Ax/Matraca | Storehouse | P 1/T 2 |
| 296 | 265 | 15 | 0 | 250 | Tractor | Tractor/Plow/Weed harrow/Matraca | Storehouse/corral | P 2 |
| 2.36 | 188 | 9 | 0 | 179 | Tractor | Tractor/Plow | Shed/Corral | T 16 |
| 242 | 73 | 5 | 0 | 68 | Slash and Burn | Matraca/Hoe/Reaping hook | Shed/Corral | T 2 |
| 106 | 68 | 5 | 0 | 63 | Slash and Burn | Matraca/Hoe/Reaping hook | Shed/Corral/Storehouse | T 2 |
| 184 | 83 | 16 | 0 | 73 | Tractor | Tractor/Plow/Blade/Trailer/Grinder | Corral/Sheed/Deposit | T 2 |
| 121 | 101 | 0 | 101 | 20 | Tractor | Tractor/Plow/Blade/Tractor | Storehouse/Sheed/Corral | 1 P/4 T |

| No. of Working Days | Average Salary | Inputs | Own Credit | Commercialization Location | Commercialization Manner | Technical Assistance | Expenses | Organization |
|---------------------|--------------------|------------|------------|----------------------------|--------------------------|----------------------|----------|--------------|
| - | 150 | S/F | Yes | Municipality | Retailer | No | 2160 | Yes |
| 360 | 120 | Seeds | Yes | Municipality | Retailer | No | 2400 | No |
| 4 | 5/day | - | Yes | Municipality | - | Yes | 2220 | No |
| 10 | 6/day | Fertilizer | Yes | Municipality | Retailer | Yes | 3492 | Yes |
| 360 | 1.5 | S/S/N | No | Municipality | Retailer | Yes | 10200 | No |
| P 360/T 15 | P 15/day, T 16/day | Seeds | Yes | State | Wholesaler | Yes | 2760 | No |
| 60 | 5/day | S/S/N | Yes | Municipality | Retailer | Yes | 2640 | Yes |
| P 360/T 15 | P 15/day, T 5/day | S/S/N | Yes | Municipality | Retailer | Yes | 4104 | Yes |
| 360 | 1 Salary (minimum) | S/S/N | Yes | Municipality | Retailer | Yes | 4752 | No |
| 60 | 5/day | S/S/N | Yes | Municipality | Retailer | Yes | 6360 | No |
| 180 | 5/day | Seeds | Yes | Municipality | Retailer | Yes | 240 | Yes |
| 16 | 5/day | S/S/N | Yes | Municipality | Retailer | No | 10920 | No |
| 20 | 6/day | S/S/N | Yes | Municipality | Retailer | No | 5268 | Yes |
| 360 P/100 T | 150 P, T 7/day | Seeds | Yes | Municipality | Retailer | Yes | 5160 | Yes |

Table IV-7.2 (1) Rural Producers Survey Resume - Education Level

| Region | Illiteracy | 1st Grade Inc. | 1st Grade Comp. | 2nd Grade Inc. | 2nd Grade Comp. | 3rd Grade | No answer |
|---------------|------------|----------------|-----------------|----------------|-----------------|-----------|-----------|
| South | 5 | 8 | 4 | 1 | 2 | 0 | 0 |
| Southwest | 5 | 5 | 6 | 0 | 1 | 3 | 0 |
| Northeast | 7 | 10 | 1 | 0 | 1 | 1 | 0 |
| Center-West | 0 | 10 | 8 | 0 | 2 | 0 | 0 |
| North | 2 | 7 | 5 | 0 | 1 | 3 | 2 |
| Extreme-North | 7 | 12 | 0 | 1 | 0 | 0 | 0 |
| Souteast | 7 | 9 | 2 | 1 | 1 | 0 | 0 |
| East | 3 | 8 | 6 | 0 | 3 | 0 | 0 |
| Central | 4 | 6 | 3 | 1 | 4 | 2 | 0 |
| Northwest | 1 | 6 | 7 | 0 | 1 | 0 | 5 |
| TOTAL | 41 | 81 | 42 | 4 | 16 | 9 | 7 |

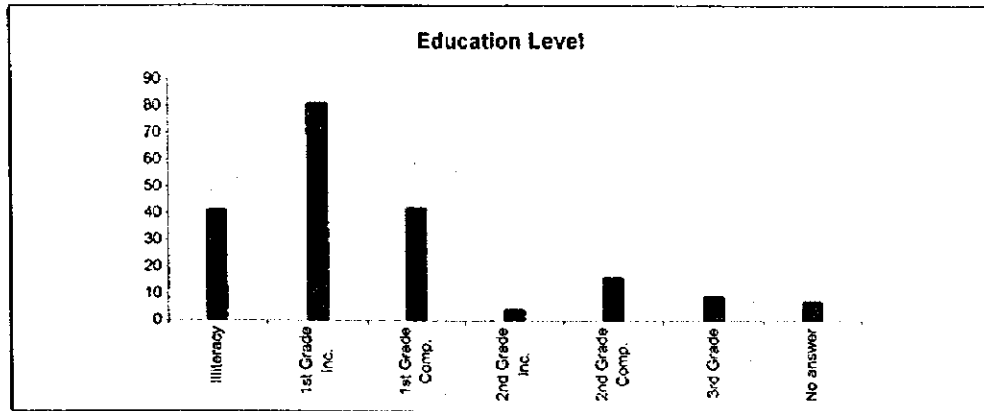


Table IV-7.2 (2) Rural Producers Survey Resume - Type of Illumination

| Region | Oil | Electricity | Oil/Gas | Oil/Candle | Gas |
|---------------|------------|-------------|-----------|------------|----------|
| South | 12 | 3 | 2 | 0 | 3 |
| Southwest | 8 | 5 | 5 | 1 | 1 |
| Northeast | 15 | 1 | 1 | 0 | 2 |
| Center-West | 11 | 7 | 2 | 0 | 0 |
| North | 12 | 6 | 0 | 2 | 0 |
| Extreme-North | 10 | 8 | 2 | 0 | 1 |
| Southeast | 14 | 2 | 4 | 0 | 0 |
| East | 13 | 5 | 2 | 0 | 0 |
| Central | 11 | 6 | 0 | 2 | 1 |
| Northwest | 7 | 2 | 11 | 0 | 0 |
| TOTAL | 113 | 45 | 29 | 5 | 8 |

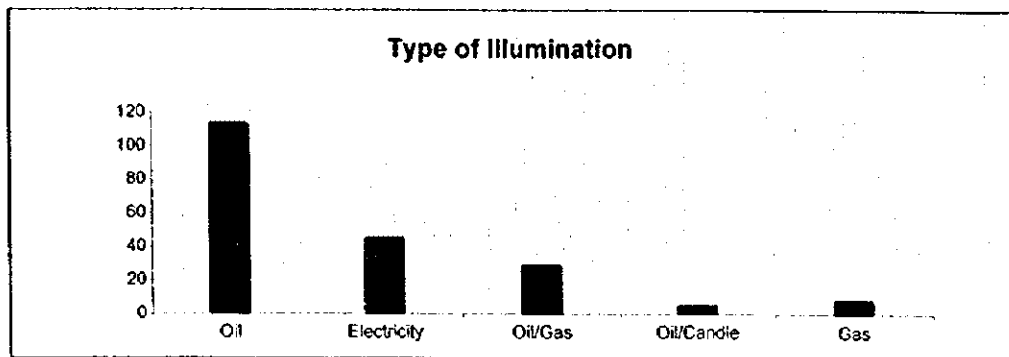


Table IV-7.2 (3) Rural Producers Survey Resume -Technical Assistance

| Region | Yes | No |
|---------------|-----------|------------|
| South | 3 | 17 |
| Southwest | 7 | 13 |
| Northeast | 0 | 20 |
| Center-West | 8 | 12 |
| North | 3 | 17 |
| Extreme-North | 5 | 15 |
| Souteast | 0 | 20 |
| East | 7 | 13 |
| Central | 4 | 16 |
| Northwest | 4 | 16 |
| TOTAL | 41 | 159 |

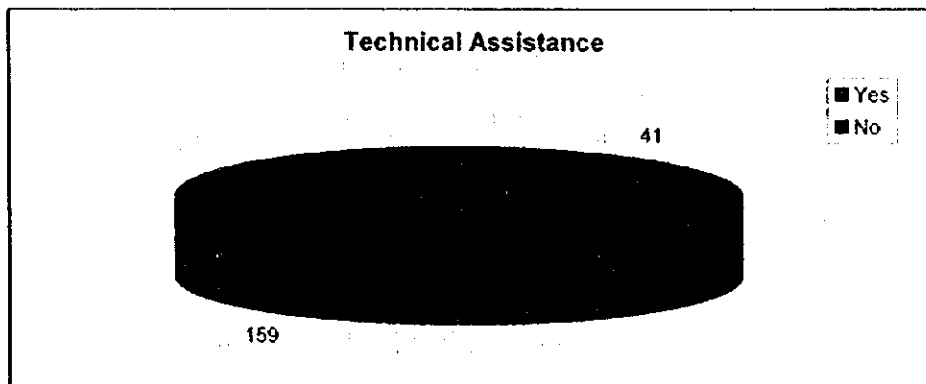


Table IV-7.2 (4) Rural Producers Survey Resume - Commercialization Location

| Region | Municipality | State | Country | No Declaration | No Commercialization |
|---------------|--------------|-----------|----------|----------------|----------------------|
| South | 14 | 2 | 1 | 0 | 3 |
| Southwest | 11 | 7 | 1 | 0 | 1 |
| Northeast | 12 | 0 | 0 | 0 | 8 |
| Center-West | 18 | 2 | 0 | 0 | 0 |
| North | 15 | 0 | 2 | 3 | 0 |
| Extreme-North | 16 | 1 | 1 | 2 | 0 |
| Souteast | 16 | 0 | 0 | 0 | 4 |
| East | 16 | 3 | 0 | 1 | 0 |
| Central | 12 | 2 | 3 | 2 | 1 |
| Northwest | 16 | 0 | 1 | 3 | 0 |
| TOTAL | 146 | 17 | 9 | 11 | 17 |

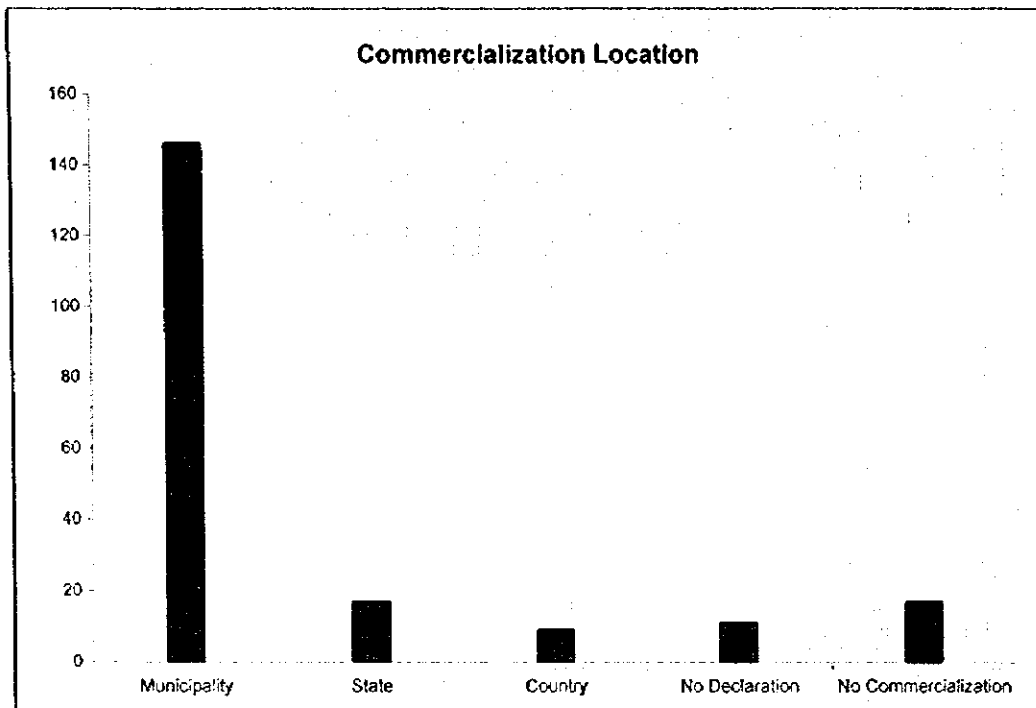


Table IV-7.2 (5) Rural Producers Survey Resume - Commercialization Manner

| Region | Wholesaler | Retail Saler | Middlemen | Others | No Declaration | No Commercialization |
|---------------|------------|--------------|-----------|-----------|----------------|----------------------|
| South | 6 | 3 | 3 | 6 | 2 | 0 |
| Southwest | 3 | 2 | 5 | 8 | 2 | 0 |
| Northeast | 3 | 5 | 2 | 3 | 7 | 0 |
| Center-West | 0 | 10 | 2 | 8 | 0 | 0 |
| North | 2 | 3 | 10 | 3 | 2 | 0 |
| Extreme-North | 2 | 9 | 4 | 4 | 1 | 0 |
| Souteast | 1 | 0 | 11 | 3 | 1 | 4 |
| East | 3 | 9 | 1 | 7 | 0 | 0 |
| Central | 10 | 2 | 1 | 1 | 5 | 1 |
| Northwest | 1 | 0 | 10 | 5 | 4 | 0 |
| TOTAL | 31 | 43 | 49 | 48 | 24 | 5 |

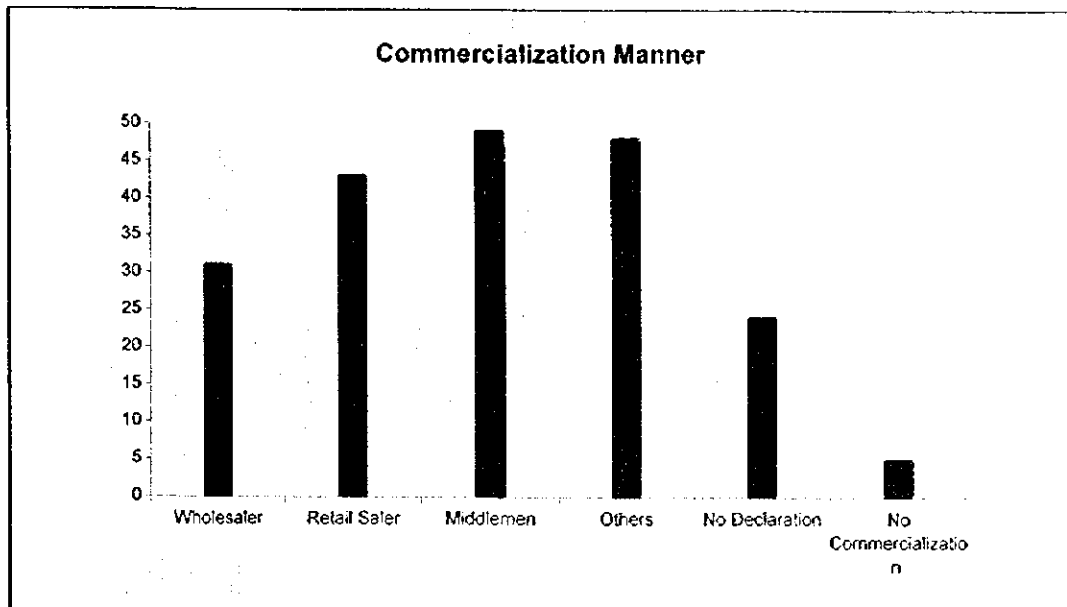


Table IV-7.2 (6) Rural Producers Survey Resume - Utilization of Inputs

| Region | S/F/A | S/F | S/A | F/A | S | F | A | No Use | No Answer |
|---------------|-----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|
| South | 5 | 6 | 0 | 0 | 0 | 5 | 0 | 4 | 0 |
| Southwest | 8 | 2 | 1 | 2 | 0 | 0 | 2 | 4 | 0 |
| Northeast | 2 | 0 | 0 | 0 | 6 | 1 | 1 | 10 | 0 |
| Center-West | 0 | 2 | 0 | 0 | 12 | 3 | 0 | 3 | 0 |
| North | 1 | 0 | 1 | 3 | 0 | 1 | 5 | 9 | 0 |
| Extreme-North | 0 | 0 | 2 | 0 | 5 | 2 | 6 | 6 | 0 |
| Souteast | 4 | 1 | 2 | 0 | 4 | 1 | 0 | 3 | 5 |
| East | 0 | 3 | 0 | 0 | 5 | 0 | 0 | 12 | 0 |
| Central | 5 | 1 | 2 | 0 | 3 | 5 | 0 | 1 | 3 |
| Northwest | 0 | 1 | 5 | 0 | 6 | 0 | 4 | 4 | 0 |
| TOTAL | 25 | 16 | 13 | 5 | 41 | 18 | 18 | 56 | 8 |

S = seeds

F = fertilizers

A = agricultural chemicals

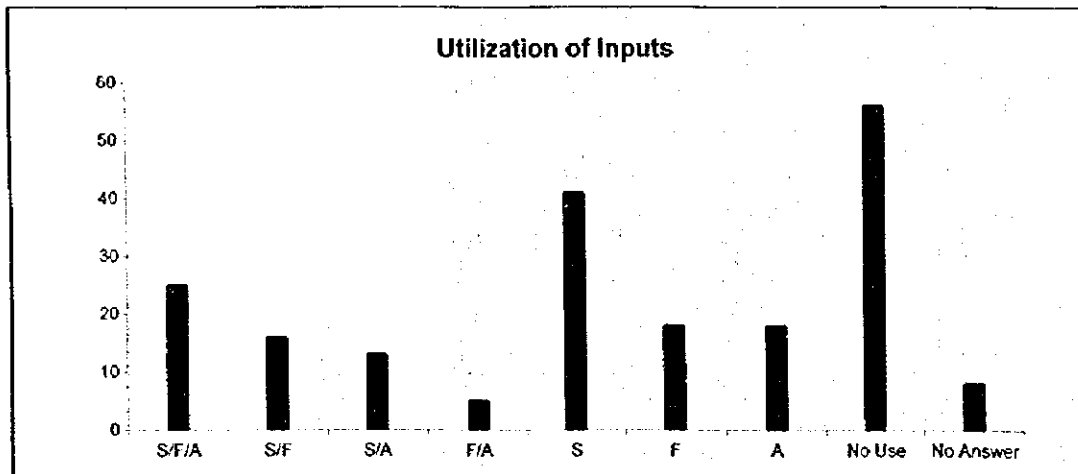


Table IV - 7.2 (7) Rural Producers Survey Resume - Soil Preparation

| Region | Tractor | Slash and Burn | Draft Animal | Manual | No Answer |
|---------------|------------|----------------|--------------|----------|-----------|
| South | 16 | 3 | 1 | 0 | 0 |
| Southwest | 11 | 6 | 3 | 0 | 0 |
| Northeast | 2 | 18 | 0 | 0 | 0 |
| Center-West | 7 | 12 | 1 | 0 | 0 |
| North | 8 | 8 | 0 | 0 | 4 |
| Extreme-North | 15 | 2 | 2 | 1 | 0 |
| Souteast | 11 | 5 | 0 | 0 | 4 |
| East | 5 | 12 | 3 | 0 | 0 |
| Central | 10 | 7 | 1 | 1 | 1 |
| Northwest | 15 | 5 | 0 | 0 | 0 |
| TOTAL | 100 | 78 | 11 | 2 | 9 |

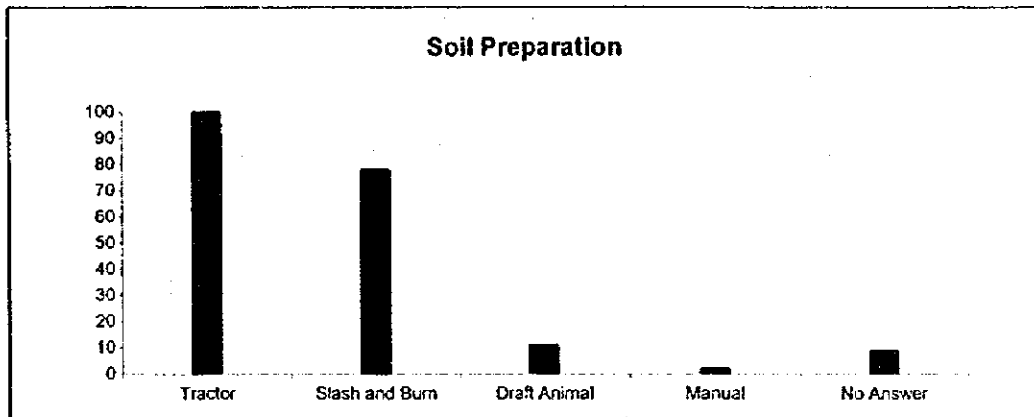


Table IV-7.2 (8) Rural Producers Survey Resume - Land Use and Ownership

| Region | Owner | Occupant | Share Cropper | Tenant |
|---------------|------------|-----------|---------------|----------|
| South | 17 | 3 | 0 | 0 |
| Southwest | 20 | 0 | 0 | 0 |
| Northeast | 18 | 2 | 0 | 0 |
| Center-West | 19 | 1 | 0 | 0 |
| North | 19 | 1 | 0 | 0 |
| Extreme-North | 14 | 3 | 0 | 3 |
| Souteast | 17 | 3 | 0 | 0 |
| East | 18 | 2 | 0 | 0 |
| Central | 19 | 1 | 0 | 0 |
| Northwest | 20 | 0 | 0 | 0 |
| TOTAL | 181 | 16 | 0 | 3 |

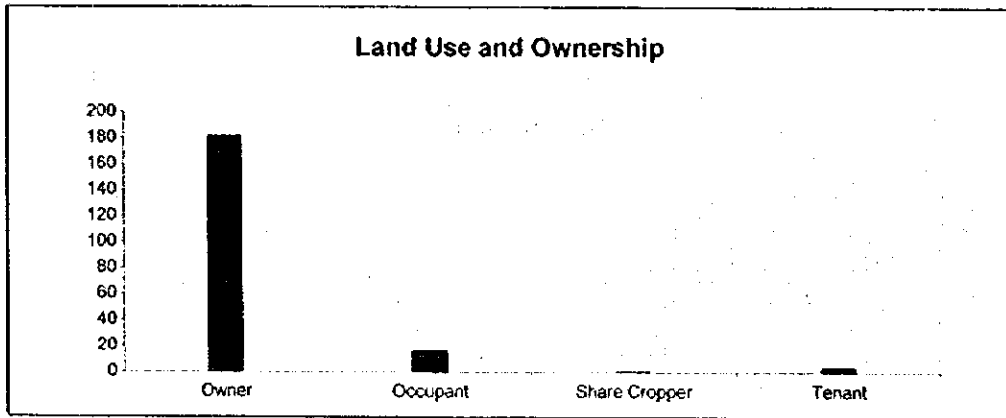


Table IV-7.2 (9) Rural Producers Survey Resume - Type of Combustible

| Region | Firewood/Gas | Gas | Firewood | No Declaration |
|---------------|--------------|-----------|-----------|----------------|
| South | 8 | 1 | 11 | 0 |
| Southwest | 11 | 5 | 4 | 0 |
| Northeast | 10 | 1 | 9 | 0 |
| Center-West | 9 | 3 | 8 | 0 |
| North | 8 | 4 | 8 | 0 |
| Extreme-North | 8 | 5 | 6 | 1 |
| Souteast | 10 | 7 | 3 | 0 |
| East | 8 | 2 | 10 | 0 |
| Central | 9 | 6 | 5 | 0 |
| Northwest | 10 | 8 | 2 | 0 |
| TOTAL | 91 | 42 | 66 | 1 |

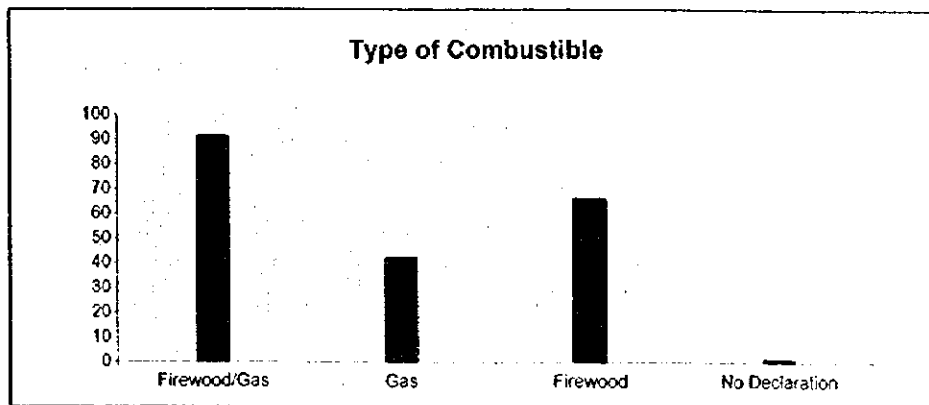


Table IV-7.3 (1) Agricultural Production System (CENTER-WEST)

| CROP | AREA (ha) | YIELD (kg/ha) | PRODUCTION (ton) | UNIT PRICE (RS) | No. of PRODUCERS |
|-------------|--------------|------------------|---------------------|--------------------|---------------------|
| Pumpkin | 279 | 91,000 | 2,495 | 0.60 ⁺ | 83 |
| Upland rice | 1,245 | 5,530 | 618 | 12.00 | 165 |
| Banana | 7 | 12,000 | 60 | 0.20 | 3 |
| Cassava | 195 | 30,500 | 1,015 | 0.35 | 150 |
| Watermelon | 50 | 30,000 | 150 | 0.18 | 3 |
| Maize | 380 | 8,800 | 600 | 12.00 | 87 |
| Rubber tree | 30 | 6,000 | 180 | -- | 1 |

Source: Data from the Assistance region supplied by RURALTINS

Remark:

* It is referred to the value of a fruit

Table IV-7.3 (2) Livestock Production System (CENTER-WEST)

| SPECIES | No. of HEADS | MAIN RACES |
|---------|--------------|--|
| Bees | 1,000 | * Beehives |
| Poultry | 1,000 | Hen, Free range, Isa Braw, Acrobac, Cobal |
| Bovine | 285,500 | Nelore, Girolanda, Guzerá, Half-breeds and Simetal |
| Caprine | 970 | Half-breed, Canindé, Bhuy, Moxotó, WDR |
| Equine | 2,015 | Crioulo, Half-breed, Quarto de Milha, Manga Larga, WDR |
| Mules | 1,440 | WDR |
| Ovine | 780 | Half-breed, Sta. Inês |
| Fish | 4,000 | Tambaqui |
| Swine | 9,890 | Piau, Landrace, Lawhit, Duroc and Common |

| No. of PRODUCERS | PASTURE AREA (ha) | | |
|------------------|-------------------|------------|---------|
| 1055 | Natural | Artificial | Total |
| | 78,819 | 140,270 | 219,089 |

| No. of PRODUCERS ACCORDING TO THE SIZE OF THE HERD | SIZE OF THE HERD | | | | |
|--|------------------|------------|-------------|--------------|-------|
| | <100 | 100 to 500 | 500 to 1000 | 1000 to 5000 | >5000 |
| 779 | 211 | 48 | 25 | 2 | |

Source: Data from the Assistance region supplied by RURALTINS

Remark:

WDR: Without Defined Race

Table IV-7.4 (1) Agricultural Production System (SOUTH)

| CROP | AREA (ha) | YIELD (kg/ha) | PRODUCTION (ton) | UNIT PRICE (RS) | No. of PRODUCERS |
|----------------|-----------|---------------|------------------|-----------------|------------------|
| Pumpkin | 200 | 2,300 | 460 | 0.16 | 20 |
| Upland rice | 2,900 | 7,150 | 4,175 | 1.40 | 402 |
| Irrigated rice | 625 | 7,200 | 100 | 1.50 | 15 |
| Banana | 60 | 20,000 | 1,200 | 10.00* | 70 |
| Orange | 30 | 33,670 | 2,020 | 6.00* | 5 |
| Lemon | 3 | 116,670 | 350 | 7.00* | 1 |
| Cassava | 325 | 69,948 | 7,700 | 0.30 | 352 |
| Watermelon | 40 | 2,500 | 100 | 1.50 | 15 |
| Maize | 2,765 | 10,254 | 6,200 | 1.30 | 850 |
| Soybean | 350 | 3,720 | 654 | 0.19 | 71 |

Source: Data from the Assistance region supplied by RURALTINS

Remark:

* It is referred to the value of the box.

Table IV-7.4 (2) Livestock Production System (SOUTH)

| SPECIES | No. of HEADS | MAIN RACES |
|-----------|--------------|---|
| Poultry | 113,000 | Hen, Free range, Isa Braw, Acrobac, Cobal |
| Bovine | 285,500 | Nelore, Half-breed, Girolando |
| Caprine | 1,300 | Half-breed, WDR |
| Equine | 6,200 | Manga Larga, Quarto de Milha, Campolina, Half-breed |
| Mules | 1,950 | Pega, WDR, Mule |
| Ovine | 1,360 | Pé Duro, WDR |
| Buffaloes | 860 | Murrah, Jaffarabadi and Mediterrâneo |
| Swine | 14,000 | Piau, Landace, Half-breed |

| No. of PRODUCERS | PASTURE AREA (ha) | | |
|------------------|-------------------|------------|---------|
| 1789 | Natural | Artificial | Total |
| | 298,510 | 221,090 | 519,600 |

| No. of PRODUCERS ACCORDING TO THE SIZE OF HERD | TAMANHO DO REBANHO | | | | |
|--|--------------------|------------|-------------|--------------|-------|
| | <100 | 100 to 500 | 500 to 1000 | 1000 to 5000 | >5000 |
| | 1,139 | 450 | 129 | 69 | 02 |

Source: Data from the Assistance region supplied by RURALTINS

Remark;

WDR - Without Defined Race

Table IV-7.5 (1) Agricultural Production System (EAST)

| CROP | AREA (ha) | YIELD (kg/ha) | PRODUCTION (ton) | UNIT PRICES (RS) | No. of PRODUCERS |
|---------------|--------------|------------------|---------------------|---------------------|---------------------|
| Rice | 24 | 900 | 21,6 | 10,00 | 20 |
| Feijão beans* | 05 | 640 | 3,2 | 13,00 | 16 |
| Maize** | 03 | 595 | 17,85 | 50,00 | 12 |

Source: Data from the Assistance region supplied by RURALINS

Remark:

* Feijão beans (known as "feijão de corda")

** Maize is combined with rice.

Table IV-7.5 (2) Livestock Production System (EAST)

| SPECIES | No. of HEADS | MAIN RACES |
|---------|--------------|----------------|
| Poultry | 915 | Free range |
| Bovine | 5,510 | Nelore and Gir |
| Equine | 80 | Half-breed |
| Mules | 58 | Half-breed |
| Swine | 62 | Half-breed |

| No. of PRODUCERS | PASTURE AREA (ha) | | |
|------------------|-------------------|------------|--------|
| 150 | Natural | Artificial | Total |
| | 8,703 | 2,178 | 10,881 |

| No. of PRODUCERS ACCORDING TO THE SIZE OF THE HERD | SIZE OF HERD | | | | |
|--|--------------|---------------|-------------|--------------|-------|
| | <100 | 100 to 500 | 500 to 1000 | 1000 to 5000 | >5000 |
| 150 | | | | | |

Source: Data from the Assistance region supplied by RURALINS

Table IV-7.6 (1) Agricultural Production System (SOUTHEAST)

| CROP | AREA (ha) | YIELD (kg/ha) | PRODUCTION (ton) | UNIT PRICE (RS) | No. of PRODUCERS |
|--|-----------|---------------|------------------|-----------------|------------------|
| Upland rice | 1,242.0 | 3,910 | 1,420.0 | 10.00* | 1,104 |
| Cassava | 3,525.0 | 19,100 | 547.5 | 0.40 | 1,290 |
| Maize | 835.0 | 3,770 | 977.0 | 12.00* | 1,823 |
| Feijão beans (2 nd harvest) | 18.0 | 273 | 4.2 | 9.20* | 38 |
| Tomato | 0.5 | 35 | 17.5 | 5.00** | 3 |

Source: Data from the Assistance region supplied by RURALTINS

Remark:

* It is referred to 60 kg bag

** It is referred to the value of a box.

Table IV-7.6 (2) Livestock Production System (SOUTHEAST)

| SPECIES | No. of HEADS | MAIN RACES |
|---------|--------------|--|
| Poultry | 6,750 | Half-breed and Free range hens |
| Bovine | 83,100 | Aneloradas, Girolanda, Simetal, Nelore, Gir and Guzerá |
| Equine | 9,840 | Half-breed |
| Mules | 992 | Half-breed |
| Swine | 1,500 | Half-breed and Piau |
| Ovine | 100 | Half-breed |

| No. of PRODUCERS | PASTURE AREA (ha) | | |
|------------------|-------------------|------------|---------|
| | Natural | Artificial | Total |
| 865 | 186,330 | 37,690 | 224,020 |

| No. of PRODUCERS ACCORDING TO THE SIZE OF THE HERD | SIZE OF THE HERD | | | | |
|--|------------------|------------|-------------|--------------|-------|
| | <100 | 100 to 500 | 500 to 1000 | 1000 to 5000 | >5000 |
| | 517 | 381 | 115 | 11 | 1 |

Source: Data from the Assistance region supplied by RURALTINS

Table IV-7.7 (1) Agricultural Production System (SOUTHWEST)

| CROP | AREA (ha) | YIELD (kg/ha) | PRODUCTION (ton) | UNIT PRICE (RS) | No. of PRODUCERS |
|----------------|-----------|---------------|------------------|-----------------|------------------|
| Pineapple | 10 | 19,000 | 190,000.0 | 0.60* | 2 |
| Upland rice | 2,003 | 12,050 | 2,648.2 | 12.00 | 149 |
| Lowland rice | 10 | 900 | 9.0 | 16.00** | 1 |
| Irrigated rice | 4,250 | 7,700 | 12,180.0 | 17.00** | 48 |
| Banana | 23 | 17,000 | 391.0 | 10.00# | 5 |
| Orange | 2 | 30,550 | 61,100.0 | 6.00# | 2 |
| Cassava | 98 | 42,000 | 308,000.0 | 30.00## | 618 |
| Watermelon | 83 | 48,000 | 530,500.0 | 100.00## | 16 |
| Maize | 2,906 | 6,050 | 87,990.0 | 12.00## | 392 |

Source: Data from the Assistance region supplied by RURALTINS

Remarks:

*unit value of fruit, ** value of 60 kg bag, # value of a box, ## value of a ton

Table IV-7.7 (2) Livestock Production System (SOUTHWEST)

| SPECIES | No. of HEADS | MAIN RACES |
|---------|--------------|--|
| Poultry | 16,396 | Free range and Rhodia |
| Bovine | 209,233 | Nelore, Half-breed, Gir, Tabapuã, Girolanda. |
| Caprine | 70 | Common/Half-breed |
| Equine | 2,612 | Mangalarga, Quarto de Milha, |
| Mules | 1,557 | Common/Half/breed, Pega, |
| Ovine | 1,279 | Common |
| Swine | 2,841 | Black, Piau |

| No. of PRODUCERS | PASTURE AREA (ha) | | |
|------------------|-------------------|------------|---------|
| 1,053 | Natural | Artificial | Total |
| | 202,220 | 254,981 | 457,201 |

| No. of PRODUCERS ACCORDING TO THE SIZE OF THE HERD | SIZE OF HERD | | | | |
|--|--------------|------------|-------------|--------------|-------|
| | <100 | 100 to 500 | 500 to 1000 | 1000 to 5000 | >5000 |
| | 536 | 390 | 84 | 33 | 10 |

Source: Data from the Assistance region supplied by RURALTINS

Remark:

WDR - Without Defined Race

Table IV-7.8 (1) Agricultural Production System (NORTHEAST)

| CROP | AREA (ha) | YIELD (kg/ha) | PRODUCTION (ton) | UNIT PRICE (RS) | No. of PRODUCERS |
|--------------|-----------|---------------|------------------|-----------------|------------------|
| Rice | 750 | 1,800 | 1,350.0 | 10.00 * | 50 |
| Maize | 500 | 2,100 | 1,050.0 | 9.00 * | 45 |
| Feijão beans | 20 | 600 | 12.0 | 40.00 * | 20 |
| Cassava | 150 | 40,000 | 6,000.0 | 20.00 ** | 50 |

Source: Data from the Assistance region supplied by RURALHNS

Remarks:

*value of 60kg bag, **value of a ton

Table IV-7.8 (2) Livestock Production System (NORTHEAST)

| SPECIES | No. of HEADS | MAIN RACES |
|---------|--------------|--------------------|
| Bovine | 12,087 | Nelore, Half-breed |
| Swine | 1,330 | Common/Half-breed |
| Poultry | 12,019 | Common/Half-breed |

| No. of PRODUCERS | PASTURE AREA (ha) | | |
|------------------|-------------------|------------|--------|
| 225 | Natural | Artificial | Total |
| | 58,501 | 15,000 | 73,501 |

| No. of PRODUCERS ACCORDING TO THE SIZE OF THE HERD | SIZE OF HERD | | | | |
|--|--------------|------------|-------------|--------------|-------|
| | <100 | 100 to 500 | 500 to 1000 | 1000 to 5000 | >5000 |
| | 198 | 23 | 04 | - | - |

Source: Data from the Assistance region supplied by RURALHNS

Table IV-7.9 (1) Agricultural Production System (NORTHWEST)

| CROP | AREA (ha) | YIELD (kg/ha) | PRODUCTION (ton) | UNIT PRICE (RS) | No. of PRODUCERS |
|--------------|-----------|---------------|------------------|-----------------|------------------|
| Upland rice | 540 | 1,845 | 617.0 | 11.00 | 106 |
| Upland maize | 200 | 1,645 | 582.0 | 11.00 | 99 |
| Feijão beans | 40 | 280 | 11.2 | 50.00 | 14 |
| Cassava | 90 | 16,000 | 1,440.0 | 20.00 | 110 |
| Banana | 80 | 11,000 | 380.0 | 3.00 | 08 |
| Pineapple | 20 | 1,000 | 290.0 | 0.35 | 03 |
| Watermelon | 10 | 45,000 | 450.0 | 0.25 | 06 |

Source: Data from the Assistance region supplied by RURALTINS

Table IV-7.9 (2) Livestock Production System (NORTHWEST)

| SPECIES | No. of HEADS | MAIN RACES |
|-----------|--------------|-------------------------------------|
| Bovine | 311,307 | Nelore, Gir, Girolanda |
| Swine | 21,305 | Landrace, Large White, Duroc, Piau |
| Poultry | 93,623 | Turkey, Duck, Hen, Guinea Fowl, WDR |
| Equine | 5,000 | Campolina, Apalosa, Quarto de Milha |
| Mules | 2,100 | WDR |
| Caprine | 1,100 | WDR, Anglo-nubiana |
| Ovine | 1,400 | Morada Nova, Santa Inês |
| Buffaloes | 4,000 | Mediterrâneo, Jafarabadi, WDR |

| No. of PRODUCERS | PASTURE AREA (ha) | | |
|------------------|-------------------|------------|--------|
| 1,462 | Natural | Artificial | Total |
| | 22,500 | 56,300 | 78,800 |

| No. of PRODUCERS ACCORDING TO THE SIZE OF THE HERD | SIZE OF HERD | | | | |
|--|--------------|------------|-------------|--------------|-------|
| | <100 | 100 to 500 | 500 to 1000 | 1000 to 5000 | >5000 |
| 1,000 | 378 | 69 | 12 | 2 | |

Source: Data from the Assistance region supplied by RURALTINS

Table IV-7.10 (1) Agricultural Production System (CENTRAL)

| CROP | AREA (ha) | YIELD (kg/ha) | PRODUCTION (Ton) | UNIT PRICE (RS) | No. of PRODUCERS |
|--------------|-----------|---------------|------------------|-----------------|------------------|
| Pineapple | 260.50 | 60,000 | 4,805.0 | 0.50 | 118 |
| Upland rice | 3,132.83 | 6,990 | 4,253.5 | 10.00 * | 536 |
| Feijão beans | 107.00 | 350 | 37.0 | 40.00 * | 50 |
| Banana | 460.20 | 7,000 | 3,221.0 | 1.00 | 143 |
| Cassava | 265.70 | 55,000 | 5,830.0 | 0.32 | 166 |
| Watermelon | 72.30 | 52,400 | 966.0 | 0.25 | 33 |
| Maize | 2,153.51 | 7,500 | 5,169.0 | 10.00 * | 327 |
| Soybean | 453.24 | 2,100 | 952.0 | 10.00 * | 2 |

Source; Data from the Assistance Region supplied by RURALTINS

Remark;

* It is referred to the price of a 60 kg bag

Table IV-7.10 (2) Livestock Production System (CENTRAL)

| SPECIES | No. of HEADS | MAIN RACES |
|---------|--------------|------------------------------------|
| Poultry | 1,586 | Free range |
| Bovine | 8,725 | Nelore, Half-breed, WDR, Girolanda |
| Caprine | 176 | WDR |
| Equine | 88 | WDR |
| Mules | 25 | WDR |
| Ovine | 60 | WDR |
| Swine | 150 | Free range, Piau |

| No. of PRODUCERS | PASTURE AREA (ha) | | |
|------------------|-------------------|------------|--------|
| | Natural | Artificial | Total |
| 241 | 8,626 | 8,811 | 17,357 |

| No. of PRODUCERS ACCORDING TO SIZE OF HERD | SIZE OF THE HERD | | | | |
|--|------------------|------------|-------------|--------------|-------|
| | <100 | 100 to 500 | 500 to 1000 | 1000 to 5000 | >5000 |
| | 180 | 55 | 04 | 02 | -- |

Source; Data from the Assistance Region supplied by RURALTINS

Remark;

WDR - Without Defined Race

Table IV-7.11 (1) Agricultural Production System (NORTH)

| CROP | AREA (ha) | YIELD (kg/ha) | PRODUCTION (ton) | UNIT PRICE (R\$) | No. of PRODUCERS |
|---------------|-----------|---------------|------------------|------------------|------------------|
| Upland rice | 394.0 | 1,176 | 408.7 | 10.00 | 146 |
| Upland maize | 647.0 | 1,460 | 853.0 | 9.00 | 94 |
| Feijão beans | 73.0 | 325 | 27.9 | 48.00 | 49 |
| Cassava | 338.0 | 11,400 | 4,262.0 | 29.00 | 157 |
| Watermelon | 40.0 | 35,000 | 1,500.0 | 1.50 | 07 |
| Pineapple | 52.0 | 20,000 | 720,000* | 1.25 | 47 |
| Passion fruit | 11.5 | 16,000 | 33.0 | 0.35 | 07 |
| Banana | 41.0 | - | 15,200.0 | - | 14 |
| Tomato | 02.0 | - | - | - | 02 |

Source: Data from the Assistance region supplied by RURALTINS

Remarks:

*fruits

Table IV-7.11 (2) Livestock Production System (NORTH)

| SPECIES | No. of HEADS | MAIN RACES |
|-----------|--------------|------------------------------------|
| Bovine | 200,270 | Nelore, Girolanda, Gir, Half-breed |
| Swine | 670 | Piau, Landrace, Large White |
| Poultry | 5,250 | Free-range |
| Equine | 1,180 | Quarto de Milha |
| Mules | 970 | Common |
| Caprine | 607 | Saane, Pardo, Alpina, Common |
| Ovine | 468 | Santa Inês, Morada Nova, Common |
| Buffaloes | 3,072 | Jafarrabadi and Murra |
| Fish | 15,000 | Tambaqui, Pacu and Tilapia |

| No. of PRODUCERS | PASTURE AREA (ha) | | |
|------------------|-------------------|------------|---------|
| | Natural | Artificial | Total |
| 225 | 333,555 | 257,117 | 590,672 |

| No. of PRODUCERS ACCORDING TO THE SIZE OF THE HERD | SIZE OF HERD | | | | |
|--|--------------|------------|-------------|--------------|-------|
| | <100 | 100 to 500 | 500 to 1000 | 1000 to 5000 | >5000 |
| | 408 | 269 | 153 | 55 | 34 |

Source: Data from the Assistance region supplied by RURALTINS

**Table IV-7.12 (1) Agricultural Production System
(EXTREME-NORTH)**

| CROP | AREA (ha) | YIELD (kg/ha) | PRODUCTION (ton) | UNIT PRICE (RS) | No. of PRODUCERS |
|--------------|--------------|------------------|---------------------|--------------------|---------------------|
| Upland rice | 1,402.9 | 1,525.0 | 1,915.8 | 10.00 | 950 |
| Upland maize | 1,488.0 | 1,220.0 | 1,724.8 | 9.00 | 721 |
| Feijão beans | 352.0 | 372.5 | 113.4 | 48.00 | 567 |
| Cassava | 172.5 | 13,000.0 | 2,297.0 | 36.00 | 225 |
| Watermelon | 15.0 | 16,000.0 | 260.0 | 0.20 | 10 |

Source: Data from the Assistance region supplied by RURALTINS

Table IV-7.12 (2) Livestock Production System (EXTREME-NORTH)

| SPECIES | No. of HEADS | MAIN RACES |
|-----------|--------------|-----------------------------|
| Bovine | 34,996 | Nelore, Girolanda, Tapuã |
| Swine | 1,265 | Piau, Cuie, WDR |
| Poultry | 7,170 | Indiana, Free-range |
| Equine | 649 | Quarto de Milha, Common WDR |
| Mules | 9 | Common |
| Caprine | 70 | Coro de Boi |
| Ovine | 150 | |
| Buffaloes | - | |

| No. of PRODUCERS | PASTURE AREA (ha) | | |
|------------------|-------------------|------------|--------|
| | Natural | Artificial | Total |
| 957 | 9,000 | 27,911 | 36,911 |

| No. of PRODUCERS ACCORDING TO THE SIZE OF THE HERD | SIZE OF HERD | | | | |
|--|--------------|------------|-------------|--------------|-------|
| | <100 | 100 to 500 | 500 to 1000 | 1000 to 5000 | >5000 |
| 923 | 63 | 09 | 01 | - | |

Table IV-7.13 (1) Crop Calendar (CENTRAL)

| CROP | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------------|-----|-----|-----|-----|------|------|-----|-----|-----|-----|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pineapple | | | | | | | Pt | | P/A | C | | CAC | CAC | CAC | | CAC | | | | | | | | |
| Upland rice | | | | | | | | | | Pt | Pt | P/A | C/C | C/C | Co | Co | | | | | | | | |
| Cassava | | | | Pt | P/Pu | Ac | Co | | | | A/Ac | C/Ac | C/Ac | C/Ac | | | | | | Co | | | | Co |
| Watermelon | | | Pt | Pt | P | Ac/P | Co | | | Pt | Pt | C/Ac | C/Ac | Ac | | Co | Co | | | | | | | |
| Maize | | | | | | | | | | | | | | | | | | | | | | | | |

Source: Data from the Assistance Region supplied by RURALTINS

Table IV-7.13 (2) Crop Calendar (CENTER-WEST)

| CROP | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pineapple | | Co | Co | Co | | | | | Pt | Pt | Ap | Ap | Ac | C | Ac | C | | | | | | | | |
| Lettuce | Co | Ap | Co | Ap | Co | Ap | Co | Ap | Co | Ap | Co | Ap | Co | Ap | Co | Ap | Co | Ap | Co | Ap | Co | Ap | Co | Ap |
| Upland rice | | | | | | Co | | | | Pt | Ac | | C | | | | | | | | | | Ac | |
| Citrus | | | Ac | | Co | Co | | | | Pt | Ac | | C | | | | | | | | | | Ac | |
| Coconuts | Pu | | Ac | | | | | | Pt/P | Pt/P | Pt/P | | | C | | | | | | | | | Ac | |
| Feijão beans | | Pt | P | | | Co | | | | | Ap | | C | Ac | | | | | | | | | Ac | |
| Guariroba | | | | | | | | | | Pt | Ap | C | C/Ac | C | | Co | Co | Co | Co | Co | | | Co | Co |
| Cassava | | | | | | | | | | Pt | Ap | C | C/Ac | C | Pt | Ap | Ap | Ac | Ac | Pu | Pu | Pu | Co | Co |
| Watermelon | | | | | | | | | | Pt | Ap | Ac | Ac | C | | Co | | | | | | | | |
| Maize | | | | | | | | | | Pt | Ap | Ac | C | Ac | | | | | | | | | | |
| Pupunha | | | | | | | | | | Pt | Ap | | C | Ac | Pt | Ap | Ap | Ac | Ac | Pu | Pu | Pu | Co | Co |
| Tomato | | | | | | | | | | | | | | | | | | | | | | | | |

Source: Data from the Assistance Region supplied by RURALTINS

Table IV-7.13 (3) Crop Calendar (SOUTHEAST)

| CROP | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|--------------|-----|-----|-----|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Upland rice | P | | Co | Co | | | | | | Pt | P/A | P/A | Ac | Co | Co | Co | | | | | | | | C |
| Banana | | | | | | | | | | Pt | Pt | A/P | C | C | | | | | | | | | | |
| Feijão beans | | Pt | Ap | C | Co | | | | | | A/P | Ap | Ac | C | | | | | | | Co | Co | Co | |
| Cassava | | | | | | | | | | | | | | | | | | | | | | | | |
| Watermelon | | | | Pt | A/C | C | | Co | | | A/P | C | Ac | Ac | | Co | Co | | | | | | P | C |
| Maize | | | | | Co | Co | | | Pt | Pt | A/P | C | Ac | Ac | | | Co | Co | | | Pt | | P | C |
| Tomato | | | Pt | Ap/P | T/Pu | C/Pu | Co | Co | | | | | | | | | | | | | | | | |

Source: Data from the Assistance Region supplied by RURALTINS

Table IV-7.13 (4) Crop Calendar (SOUTHWEST)

| CROP | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|------|-----|-----|-----|-----|
| Pineapple | | | | | | | | | | PT | A/P | A/P | AC | A/C | | | | | | | | | | |
| Upland rice | | | | | | | | | | PT | PT | A/P | A/C | A/C | CO | CO | PC | PC | | | | | | |
| Banana | | | | | | | | | | PT | AP | A/P | | | AC | AC | | | | | | | | |
| Orange | | | | | | | | | | PT | A/P | A/P | | | AC | AC | | | | | | | | |
| Cassava | | | | | | | | | | PT | A/P | A/P | C | C | PU | | PT | PT/P | A | A/AC | PU | CO | | |
| Watermelon | | | PT | A/P | AC | C | C | | | PT | PT | A/P | A/P | AC | AC | CO | CO | PC | PC | | | | | |
| Maize | | | | | | | | | | PT | PT | A/P | A/P | AC | AC | CO | CO | PC | PC | | | | | |

Source: Data from the Assistance region supplied by RURALTINS

Table IV-7.13 (5) Crop Calendar (NORTHEAST)

| CROP | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Rice | | | | | | | | | PT | | AP | AP | AC | C | CO | CO | | | | | | | | |
| Maize | | | | | | | | | PT | PT | AP | C | | C | CO | CO | | | | | | | | |
| Feijão beans | | | | | | | | | | PT | | AP | PT | AP | AP | C | CO | CO | | | | | | |
| Soybean | | | | | | | | | | | AP | AP | PC | | CO | CO | | | | | | | | |
| Cassava | | | | | | CO | CO | | PT | PT | AP | AP | | | | | | | | | | | | |

Table IV-7.13 (6) Crop Calendar (NORTHWEST)

| Cultura | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------|------|----------|-----|-----|-----|------|-----|-----|-----|-----|-----|
| Rice | | | | | | | | | pt | pt | a/p | a/p | p/c/ac | c/ac | ac/pu/co | co | co | | | | | | | |
| Maize | | | | | | | | pt | | pt | a/p | a/p | pu/e/ac | c/ac | co | co | co | | | | | | | |
| Feijão beans | | | | | | | | | | | pt | | pt | a/p | c | | co | | | | | | | |
| Cassava | | | | | | | | | | | a/p | | c/ac | | | | pt | co | c/ac | co | | | | |
| Watermelon | | | | | | | | | | | a/p | | | | | | pt | a/p | c/ac | co | | | | |

Table IV-7.13 (7) Crop Calendar (NORTH)

| CROP | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---------------|-----|-----|-----|-----|-----|------|-----|-------|-------|------|------|-------|-------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Rice | | | | | | | | pt | pt | pt | pt/c | a/p/c | a/p/c | ac/c/ | co | co | | | | | | | | |
| Maize | | | | | | | | pt | pt | pt | p | p | c | c | | co | co | co | pc | | | | | |
| Feijão beans | | | | | | | | | pt | pt/p | pt/p | pt/p | pt | pt | p | p | c | co | co | co | pc | | | |
| Cassava | | | | | | | | pt | pt | pt | | | c | c | c | c | c | c | c | | | | co | co |
| Watermelon | | | | pt | p/a | pt/c | c | co/pc | co/pc | | | | | | | | | | | | | | | |
| Pineapple | | | | | | | ac | | pt | a/p | a/p | pt | c | c | | | | | | | c | c | c | c/co |
| Passion fruit | | co | | | | | | co | co | pt | pt | pt | a/t | | ac | | c | | | | | | | |
| Tomato | | | pt | pt | a/p | ac | ac | co/ac | co/pc | co/p | | | | | | | | | | | | | | |

Source: Data from the Assistance Region supplied by RURALTINS

Table IV-7.13 (8) Crop Calendar (EXTREME-NORTH)

| CROP | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|--------------|-----|-----|-----|-----|-------|-------|------|-----|------|------|-----|-----|-----|-------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Rice | | | | | | pt | pt | pt | pt | p | p/c | p/c | p/c | co/c | co | co | co | | | | | | | |
| Maize | | | | | | pt | pt | pt | pt | pt/p | p/c | p/c | c | c/co | co | co | co | co | | | | | | |
| Feijão beans | | | | | | pt | pt | pt | pt | p | p | p/c | co | co/pt | pt/p | p | p | co | co | co | | | | |
| Cassava | | | | co | co | co | co | co | pt | p | p/c | p/c | c | c | c | c | | | | | | | | |
| Watermelon | | | | pt | a/p/p | p/ac/ | ac/p | u | co | co | co | | | | | | | | | | | | | |
| Banana | co | co | co | co | co | pt | pt | pt | pt | p | p | | | c | c | c | c | | | | | co | co | co |
| Tomato | | | | | pt/p | pt | pt | c | c/co | c/co | co | | | | | | | | | | | | | |

Source: Data from the Assistance Region supplied by RURALTINS

Table IV-7.13 (9) Crop Calendar (SOUTH)

| CROP | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pumpkin | | | | | | | | | | Pt | Pt | Pa | C | C | Co | Co | Co | | | | | | | |
| Upland rice | | | | | | | | | | Pt | Pt | P/A | P/A | C/Ac | C/Ac | Co | Co | Pc | Pc | | | | | |
| Banana | | | | | | | | | | Pt | P/A | P/A | A/Ac | Pu | Pu | Pu | | | | | | | | |
| Orange | | | | | | | | | | Pt | P/A | C/Pu | Pu | C/Pu | Ac | Ac | | | | | | | | |
| Lemon | | | | | | | | | | Pt | P/A | C/Pu | Pu | C/Pu | Ac | Ac | | | | | | | | |
| Feijão beans | | Pt | P/A | Pu | Co | | | | | Pt | P/A | P/A | P/A | C | C | Pu | | | | | | | | |
| Cassava | | | | | | | | | | Pt | P/A | P/A | P/A | A/Ac | Ac | Co | Co | | | | | | | |
| Watermelon | | | | | | | | | | Pt | P/A | P/A | C/Ac | Co | Co | Co | Pc | Pc | | | | | | |
| Maize | | | | | | | | | | Pt | A/P | A/P | C/Ac | Co | Co | Co | Pc | Pc | | | | | | |
| Soybean | | | | | | | | | | | Pu/P/A | P/A | P/A | C/Pu | Pu | Co | Co | Pc | Pc | | | | | |

Source: Data from the Assistance Region supplied by RURALTINS

Table IV-7.13 (10) Crop Calendar (EAST)

| CROP | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Rice | | | | | | | | | | | P | | C | | CO | | | | | | | Pt | A/C | C |
| Feijão beans | | | P | | C | CO | | | | | | | | | | | | Co | | | | | | |
| Maize | | | | | | | | | | | P | | C | | CO | | | Co | | | Pt | | P | C |

Source: Data from the Assistance Region supplied by RURALTINS

Remark:

PT - Land Preparation (plowing)

A - Manuring

P - Planting

T - Transplanting

C - Weeding

AC - Coverage Manuring

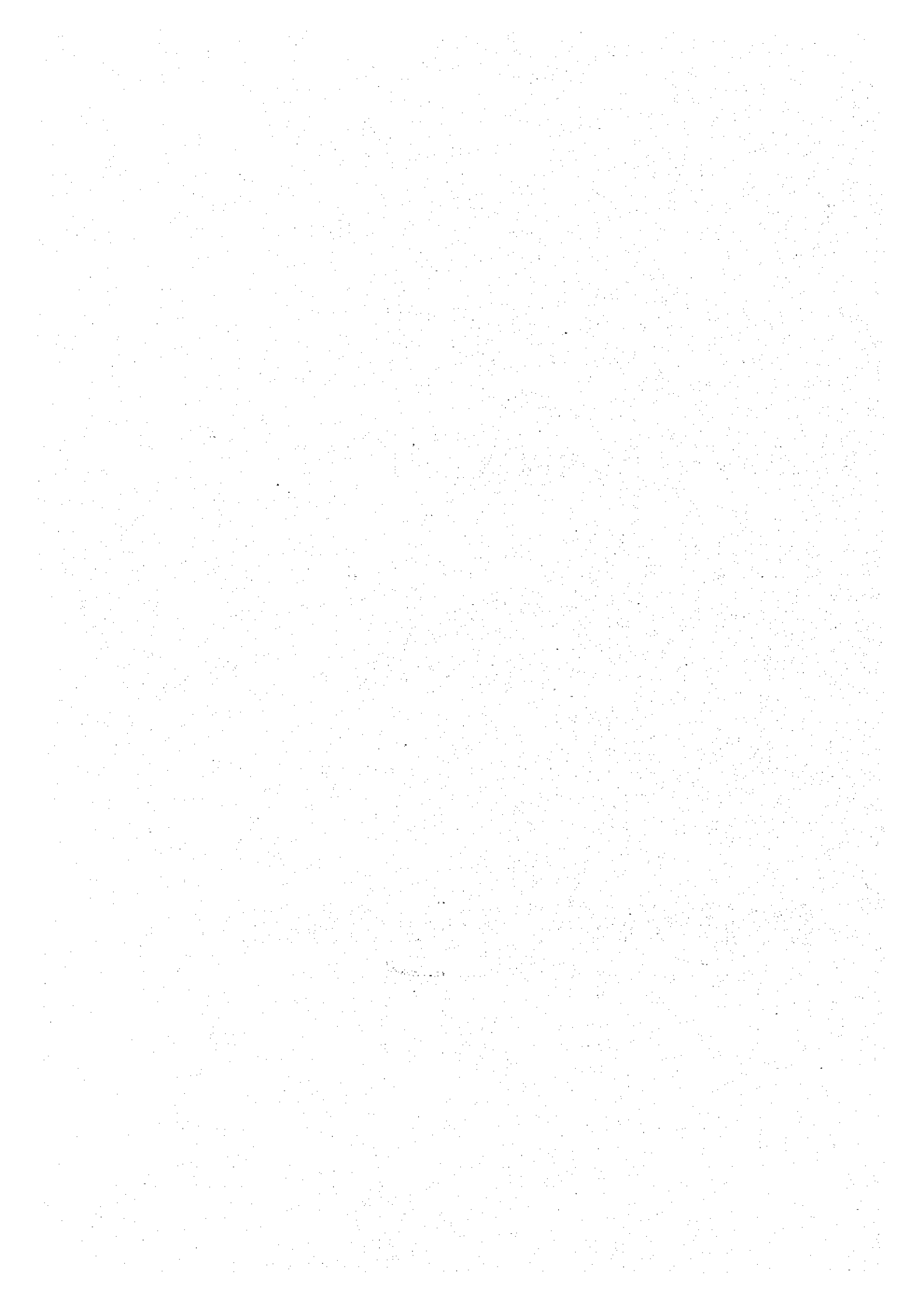
PU - Pulverization

CO - Harvest

PC - Pos-Harvest

ANNEX V

ECONOMIC CONDITIONS



ANNEX V

ECONOMIC CONDITIONS

1 Economic Performance of the State

1.1 Gross Regional Product (GRP) and GRP per capita

The GRP in the State of Tocantins together with the GDP in Brazil and the GRP in the North Region for the period of 1990-1994 is given in the table below.

Comparison of Gross Regional (Domestic) Product

Unit: In million R\$

| | 1990 | 1991 | 1992 | 1993 | 1994 | Average Growth Rate (%) |
|---------------|---------|---------|---------|---------|---------|-------------------------|
| GDP in Brazil | 455,312 | 489,859 | 485,891 | 501,731 | 519,614 | 3.36 |
| North Region | 22,855 | 23,959 | 22,494 | 24,013 | 25,068 | 2.34 |
| Tocantins | 738 | 888 | 896 | 920 | 984 | 7.44 |

Source: GAC/IPEA/DIPES(1996) and IBGE

The above table indicates that, although the GRP in Tocantins had been growing for four years since 1990 with a higher annual rate than that GDP in Brazil and that in the North Region on the average, its level still remains at lower rate accounting for only 0.19% of the GDP in 1994 (ranked at 25th among 27 states of the country and at 5th among 7 states of the North Region). Judging from the level of the GRP, the Tocantins State is reckoned as an under-developed state.

The GRP per capita for the State of Tocantins is also shown in the following table accompanying the GDP per capita in Brazil and that for the North Region.

Comparison of Gross Regional (Domestic) Product per Capita

Unit: In million R\$

| | 1990 | 1991 | 1992 | 1993 | 1994 | Average Growth Rate (%) |
|--------------|-------|-------|-------|-------|-------|-------------------------|
| Brazil | 3,146 | 3,331 | 3,253 | 3,310 | 3,380 | 1.81 |
| North Region | 2,341 | 2,382 | 2,174 | 2,259 | 2,300 | -0.44 |
| Tocantins | 823 | 966 | 948 | 949 | 993 | 4.81 |

Source: IBGE

Similar to the GRP, an annual growth rate of per capita GRP in Tocantins had been higher than the GDP per capita in Brazil and that for the North Region, but the level of per capita GRP is extremely low in comparison with that for Brazil and the North Region; hence, the State of Tocantins is situated in the 26th position among the country's 27 states of and with a proportion of 29.4% of the nation's GDP per capita and 43.2% of the average value of the GRP in the North Region.

1.2 GRP by Sector

The GRP by sector in the State of Tocantins had evolved for the period 1990-1994 in the following manner.

GRP by Sector in Tocantins

Unit: In thousand R\$

| Sectors | 1990 | 1991 | 1992 | 1993 | 1994 | Average Annual Growth(%) | Share in 1994 (%) |
|-----------|---------|---------|---------|---------|---------|--------------------------|-------------------|
| Primary | 476,813 | 542,371 | 547,844 | 555,593 | 657,893 | 8.38 | 58.9 |
| Secondary | 23,560 | 23,288 | 21,974 | 35,140 | 41,257 | 15.04 | 3.7 |
| Tertiary | 300,356 | 388,727 | 406,096 | 431,368 | 418,661 | 8.66 | 37.4 |

Source: GAC/IPEA/DIPES(1996) and IBGE

As it can be observed in the above table, the greater portion of the state's GRP is covered by the primary sector (agriculture and livestock), which is followed by the tertiary sector (commerce and services). The secondary sector (manufacturing) covers remarkably small portion of the GRP in Tocantins. So far as the annual growth rate is concerned, the primary and tertiary sectors had shown almost parallel trend, while the secondary sector, even though very small in value, had obtained significance growth.

2 State Government's Finance

2.1 State Budgetary System

Budgetary system of the states in Brazil is mainly supported by indirect tax, of which the circulation of goods and services tax (ICMS) plays the most important role (described in detail in the following section). Total amount of ICMS collected in Brazil accounts for 60% of total revenue and is greater than the federal income tax

Following the shift to civil government in 1985, a reform of the existing fiscal policy was carried out in the direction of advancing decentralization of fiscal affairs by the new constitution enacted in 1988. In this reform, expansion of autonomy for local public finance is sought by endowing state governments with a new taxation authority (ICMS collection right) to expand the subject of taxation. However, the regional economic differences have resulted in large gap in fiscal capacity among states. The federal government has decided to allocate subsidies through the constitutional provision and these subsidies will play an important role in the state budget.

There are two main methods for calculating the subsidies that are transferred from the federal government to the state government. One of them is the financial transfer system provided in the constitution and the other is transfer for specific purposes based on individual negotiation between the federal government and state.

Financial transfer system provided in the constitution: Allocated to each state based on a calculation performed according a formula using population (substitute variable of the need for fiscal spending) and income per capita (substitute variable of fiscal capacity).

Financial transfer system on negotiation basis not provided in the constitution: Allocated through individual negotiation between the federal government and state according to the need and maturity of each project implemented by the state government.

According to data from 1993 on transfers through constitutional provision, the Northeast Region received the largest percentage of subsidies to state government (52.5%) while the affluent the Southeast Region received only 8.5% of the total. The North Region (including the Tocantins State) received the largest amount per capita of 7,377 cruzeiro followed by the Northeast Region with value of 3,702 cruzeiro. Meanwhile, the amount received by the Southeast Region and the South Region was only 406 cruzeiro and 889 cruzeiro, respectively, indicating efforts for redistribution among regions to redress regional imbalance (see Table V - 2.1).

Accurate figures of fiscal transfer made on a negotiation basis cannot be grasped, as they are often included in fiscal statistics as "other revenues". While the southeastern region received only 22% of the entire fiscal transfer based on constitutional provision in 1988, it is said to have received 52% of total transfers made on a negotiation basis. Thus, transfers made on a negotiation do not necessarily serve the intended purpose.

In contrast to transfer based on constitutional provision, which is allocated mechanically according to formula without necessarily considering the individual needs of each state, transfer made on a negotiation basis may be able to realize necessary government spending if it is allocated with full consideration of individual needs and maturity of each project implemented by the state government.

In the future, revision of the current transfer based on constitutional provision from simple allocation method based on only the two variables of population and income to an allocation method that includes the necessity, urgency and maturity of fiscal spending by state should be considered.

The federal government of Brazil, with an eye to easing negative impact of economic imbalance among state on implementation of development programs/projects, has been realizing the transfer of the fund of from the National Treasury to each state of the country in such manner as more fund is distributed to states which have less per capita income. The State of Tocantins received in 1996 a transfer amount for the sum of R\$ 521,042 thousand representing about 2.5% of the federal government expenditure in the realm. The said amount is converted into R\$ 526 per capita, which is ranked in the 4th largest amount among states of the country. Furthermore, the said per capita transfer was ten times as much as that of the State of Sao Paulo (R\$ 49). From this fact, it may be concluded that different to financially affluent states of the Southeast and South Regions, the financial operation in the State of Tocantins is heavily dependent on the transfer of fund from the National Treasury.

2.2 Circulation of Goods and Service Tax (ICMS)

The circulation of goods and service tax (ICMS) was introduced in Brazil in 1988 and has been collected since 1989. Various revisions have been made in relation with application of the ICMS; for instance, the 17% tax rate that was applied to farm produce under the initial system in 1988 has now been lowered to 7%.

The federal government is deciding the tax rate by dividing the country into 8 regions and has been granting the authority of collection to state governments under the policy of promoting decentralization. Thus the tax rate is decided accepting the demands from the local level. In concrete terms, persons charge of tax matters at each state discuss and determine the tax rate at the tax council meeting of the federal government.

State tax laws concerning ICMS are comprised of two laws (codigo), i.e. tax revenue act and tax standard. Taxes are collected by taxpayer paying the tax for the previous month on the 9th day of each month.

Producers will be paying their ICMS according to the amount of their sales while distributors according to balance in receipt for articles purchased and articles sold. Transportation expenses of forwarders are tax-exempt for transportation within the same municipality and charged for transportation between municipalities.

75% of the ICMS collected by state is used as revenue for the state and the remaining 25% is allocated among municipalities. The amount of allocation is determined according to the index that incorporates the economy and social activities of each municipality. The subsidy is allocated to municipalities every week on Tuesday.

The State of Tocantins collected in 1996 as the ICMS-related revenue the amount of R\$ 138,757 thousand, which accounted for only 0.25% of the country's total sum, ranked in the 24th among 27 state of the country, while per capita revenue was R\$ 140 boosting the state's position to 21st. This per capita revenue from the ICMS was approximately 20% of the State of Sao Paulo, the highest state of the revenue, reflecting rudimentary economic activity of the state.

In the Tocantins State, various incentives are provided by adjusting the ICMS to promote undeveloped areas of industry. In the livestock industry, for instance, measures such as not imposing tax on selling and buying of cows among ranches and reducing the amount of taxes imposed at slaughterhouse and freezing stations while giving incentives to chicken farms and dairy product factories. A decision was also made to not levy ICMS on primary products that have been produced within the state. Therefore, paddy and liveweight of animals are tax exempt.

The rate of ICMS for processed farm and animal products is 7% for those distributed within the state and 12% for those distributed outside the state. In commercial and industrial sectors, the rate of ICMS imposed is 12% for items distributed inside and outside the state alike.

Concrete examples of farm and cattle industry-related ICMS as of present (May 1997) are as follows.

- (1) Cost of transportation for rice farms to carry paddy to agricultural cooperatives and rice polishers is tax-exempt. However, tax is imposed when agricultural cooperatives and rice polishers sell hulled rice.
- (2) Tax is not imposed when cattle farmers transport cattle as live-weight but is imposed when they sell processed.
- (3) Tax is not imposed on agricultural inputs that are produced within the state (e.g. lime).
- (4) Same tax rate applies to all agriculture-related products.

As it can be seen above, the Tocantins State is trying to play a frontier role in farming and livestock of Brazil by reducing the rate of the ICMS imposed on this industry.

After noticing the influence of declining export competitiveness of domestic products on employment situation, the federal government decided to eliminate the ICMS on exports starting December 1996. This will make exported soybeans tax-exempt but the tax is imposed when soybeans are sent to some oil mill in the country.

Any exception to ICMS is decided by discussion among persons in charge of tax matters at each state. Such meeting was held in Palmas City on May 27, and Tocantins State has proposed changing the nature of the existing ICMS from production tax to that of consumption tax in an effort to increase the willingness for production among producers.

At the same time, the 12% tax rate was reduced to 7% through the revision by the federal government for 8 subsistence commodities, i.e. rice, sugar, feijão beans, soybeans oil, cassava powder, commeal, coffee and salt. As 7% tax had been imposed on these subsistence commodities from before, the tax rate became the same with the rest of the country due to this revision.

While some argue that ZPE (Exports Processing Zone), which has been established in Araguaina City of this state has lost its significance owing to abolition of the ICMS for exports, it is said that its dominance will not be lost as exemption measures such as fixed assets tax, welfare tax, health insurance tax and import tax on imported materials were applied.

The ICMS is the major source of revenue for the state budget and accounted for 20.1% of the total sum of the revenue. The leading sector which contributed to the greatest portion of the ICMS dependent income was the commerce in 1995, which was followed by livestock, electricity, fuels and communications sectors. The remaining sectors such

as transport, agriculture and mining played minor role in contribution of the ICMS revenue. The Table V – 2.2 resumes revenues derived from the ICMS by sub-region in Tocantins.

2.3 Fiscal Balance in the State of Tocantins

The fiscal revenue of the state government of Tocantins depends in its great majority on the constitutional transfer from the federal government and this revenue represented approximately 60% of the total revenue and the remaining sources of the revenue are the ICMS and sale of state bonds. The proportion of the constitutional transfer has declined recently from 70% in 1994 to 60% in 1996 as cited before. The revenue from taxation has increased in these days; it had jumped twice for the period 94/95 and had multiplied by 25% for 95/96.

Tax revenue consists of ICMS, vehicles tax, service & retardation tax, inheritance tax and income tax (partially), of which the ICMS represents as large as 87%. Detailed information on tax revenue is as given in the Table V – 2.3(1).

Fiscal revenue, fiscal expenditure and their balance based on the aforementioned tax system in Tocantins State for the years 1994, 1995 and 1996 are as shown in the Table V – 2.3(2).

Changes in fiscal revenue of the State of Tocantins for the last 3 years indicate characteristics of a developing state, as exemplified by a high percentage of current transfer from the federal government in current revenue (about 70% in 1996) and increase in issuance of public bond in capital utilization (an increase of about 5.4 times from 1995 to 1996).

Public bonds issued accounts for 12 to 13% at present (1996). Although one cannot conclude at present stage that it will create a serious problem in the state, attention must be given to future changes and mode of their investment. As increase in revenue is likely to be influenced by the constitutional transfer of the federal government considering the scale of current transfer, it fluctuates largely along with changes in the Brazilian economy and its tax system, making it difficult to predict. However, an annual increase of 20 to 30% can be expected by judging from various conditions that exist at present.

The increase in investment expenditure is conspicuous among changes in fiscal expenditures, although it is natural for a developing state. Increase in repayment of domestic and foreign interest is also a natural consequence of increase in issuance of public bonds. While concrete analysis cannot be made because the conditions for issuance of public bonds are not known, fiscal utilization that will not result in stagnation of and proper investment when the time for interest payment and repayment arrives. The status of expenditure for salary-related expenses and other administrative expenses are considered to be sound. The results of expenditures by bureau of the state government are as given in the Table V – 2.3(4). The fiscal balance for the past 3 years

based on the aforementioned revenues and expenditures is as shown in the following table.

Fiscal Balance of the Government of Tocantins

Unit: In thousand R\$

| Items | 1994 | 1995 | 1996 |
|-------------|---------|---------|---------|
| Revenue | 243,285 | 524,867 | 681,148 |
| Expenditure | 340,017 | 525,261 | 626,676 |
| Balance | 96,732 | 394 | 54,472 |

Although fiscal deficit occurred in 1994 and 1995, surplus was achieved in 1996 through issuance of public bonds. Maintaining balance between development investment and issuance of public bonds and efficient utilization will continue to be important tasks in the future.

Table V - 2.1 Transfer of Funds from the National Treasury to States and Municipalities (1993)

Unit: In million of Cr\$ (total amount of transfer);
Cr\$ (per capita amount of transfer)

| States/ Regions | To States | | | To Municipalities | | | Total | | |
|--------------------|-----------------|---------------|-------|-------------------|---------------|-------|-----------------|---------------|-------|
| | Total Amount | Per capita | % | Total Amount | Per capita | % | Total Amount | Per capita | % |
| Rondonia | 8702 | 7008 | 2.8 | 2996 | 2413 | 1.0 | 11698 | 9421 | 1.9 |
| Acre | 10573 | 24167 | 3.4 | 1943 | 4441 | 0.6 | 12516 | 28608 | 2.0 |
| Amazonas | 8624 | 3889 | 2.8 | 4046 | 1824 | 1.3 | 12670 | 5713 | 2.0 |
| Roraima | 7667 | 31800 | 2.5 | 821 | 3405 | 0.3 | 8488 | 35205 | 1.4 |
| Para | 18890 | 3624 | 6.1 | 11060 | 2122 | 3.5 | 29950 | 5745 | 4.8 |
| Amapa | 10545 | 34150 | 3.4 | 1500 | 4858 | 0.5 | 12045 | 39007 | 1.9 |
| Tocantins | 13414 | 13825 | 4.3 | 6189 | 6379 | 2.10 | 19603 | 20204 | 3.2 |
| North R. | 78415 | 7377 | 25.4 | 28555 | 2686 | 9.2 | 106970 | 10063 | 17.2 |
| Maranhão | 22309 | 4384 | 7.2 | 11232 | 2207 | 3.6 | 33541 | 6591 | 5.4 |
| Piauí | 13356 | 5026 | 4.3 | 8251 | 3105 | 2.6 | 21607 | 8131 | 3.5 |
| Ceara | 22676 | 3462 | 7.3 | 15225 | 2324 | 4.9 | 37901 | 5787 | 6.1 |
| R.G. do Norte | 12913 | 5158 | 4.2 | 7657 | 3059 | 2.5 | 20570 | 8217 | 3.3 |
| Paraíba | 14801 | 4520 | 4.8 | 9794 | 2991 | 3.1 | 24595 | 7511 | 4.0 |
| Pernambuco | 21327 | 2923 | 6.9 | 14561 | 1996 | 4.7 | 35888 | 4919 | 5.8 |
| Alagos | 12858 | 4937 | 4.2 | 6919 | 2657 | 2.2 | 19777 | 7594 | 3.2 |
| Sergipe | 12843 | 8277 | 4.2 | 4404 | 2838 | 1.4 | 17247 | 11115 | 2.8 |
| Bahia | 29041 | 2365 | 9.4 | 27040 | 2202 | 8.7 | 56081 | 4568 | 9.0 |
| Northeast R. | 162124 | 3701 | 52.5 | 105083 | 2399 | 33.7 | 267207 | 6100 | 43.0 |
| Minas Genas | 13768 | 853 | 4.5 | 40511 | 2509 | 13.0 | 54279 | 3362 | 8.7 |
| Esp. Santo | 4636 | 1718 | 1.5 | 5357 | 1985 | 1.7 | 9993 | 3703 | 1.6 |
| R. de Janeiro | 4722 | 361 | 1.5 | 9325 | 714 | 3.0 | 14047 | 1075 | 2.3 |
| São Paulo | 3091 | 95 | 1.0 | 41858 | 1280 | 13.4 | 44949 | 1375 | 7.2 |
| Southeast R. | 26217 | 406 | 8.5 | 97051 | 1502 | 31.1 | 123268 | 1908 | 19.9 |
| Parana | 8911 | 1038 | 2.9 | 20765 | 2418 | 6.7 | 29676 | 3456 | 4.8 |
| S. Catarina | 3956 | 842 | 1.3 | 13325 | 2837 | 4.3 | 17281 | 3679 | 2.8 |
| R.G. do S. | 7278 | 777 | 2.4 | 23274 | 2484 | 7.5 | 30552 | 3260 | 4.9 |
| South R. | 20145 | 889 | 6.5 | 57364 | 2532 | 18.4 | 77509 | 3421 | 12.5 |
| M. Grosso do Sul | 4117 | 2225 | 1.3 | 4503 | 2434 | 1.4 | 8620 | 4659 | 1.4 |
| M. Grosso | 7133 | 3275 | 2.3 | 6242 | 2866 | 2.0 | 13375 | 6140 | 2.2 |
| Goiás | 8787 | 2106 | 2.8 | 12020 | 2881 | 3.9 | 20807 | 4988 | 3.4 |
| D. Federal | 2133 | 1275 | 0.7 | 984 | 588 | 0.3 | 3117 | 1863 | 0.5 |
| Central-West R. | 22170 | 2246 | 7.2 | 23749 | 2405 | 7.6 | 45919 | 4651 | 7.4 |
| Total | 309071 | 2039 | 100.0 | 311802 | 2057 | 100.0 | 620873 | 4096 | 100.0 |

Source: IBGE

Table V - 2.2 ICMS-Related Revenue by Sub-region of Tocantins

Unit: In thousand R\$

| Sectors | Ext. North | North | North-west | North-East | Central-west | Central | East | South | South-west | South-east | Tocantins |
|-------------|------------|-------|------------|------------|--------------|---------|------|--------|------------|------------|-----------|
| Commerce | 1544 | 8676 | 2996 | 182 | 3821 | 8331 | 68 | 12981 | 1104 | 1495 | 41203 |
| Manufact. | 60 | 433 | 53 | 3 | 245 | 140 | 4 | 1334 | 734 | 206 | 3,216 |
| Communi. | 363 | 1,661 | 586 | 111 | 644 | 3,596 | 38 | 1,547 | 269 | 450 | 9,270 |
| Livestock | 1,650 | 5,278 | 4,816 | 54 | 1,057 | 515 | 25 | 983 | 612 | 834 | 15,829 |
| Electricity | 518 | 2,057 | 782 | 106 | 878 | 3,248 | 46 | 1,764 | 490 | 491 | 10,386 |
| Agricult. | 49 | 26 | 32 | 11 | 73 | 41 | 21 | 302 | 416 | 104 | 1,079 |
| Mining | 1 | 1 | 1 | 0 | 1 | 47 | 0 | 4 | 5 | 234 | 298 |
| Transport | 161 | 1,363 | 405 | 28 | 120 | 335 | 1 | 423 | 260 | 175 | 3,274 |
| Fuels | 827 | 2,956 | 1,416 | 117 | 1,366 | 3,088 | 24 | 11,032 | 406 | 664 | 21,899 |
| Total | 5176 | 22455 | 11091 | 616 | 8210 | 19345 | 231 | 30374 | 4299 | 4657 | 106457 |

| ICMS | % | Other Taxes | % |
|------------------|-------------|----------------------------|-------------|
| - Commerce | 38.3 | - Vehicles | 1.7 |
| - Fuels | 15.1 | - Services | 4.4 |
| - Livestock | 11.7 | - Retardation | 0.7 |
| - Electricity | 7.5 | - Inheritance | 0.2 |
| - Communications | 8.5 | - Income (partially) | 5.6 |
| - Transport | 2.7 | - Miscellaneous | 0.2 |
| - Manufacturing | 2.0 | | |
| - Agriculture | 1.2 | | |
| - Mining | 0.1 | | |
| Total | 87.1 | Total (Other Taxes) | 12.9 |

Table V – 2.3(2) Total Revenue of the State Government of Tocantins

Unit: In thousand R\$

| Items | 1994 | 1995 | 1996 | Growth 96/95 |
|------------------------|----------------|----------------|----------------|--------------|
| Current revenue | 238,402 | 507,789 | 596,719 | 1.175 |
| - Taxes | 62,137 | 125,252 | 157,153 | 1.255 |
| - Public imposts | - | - | - | |
| - Transfer of property | 3,769 | 22,087 | 11,951 | |
| - Services | 116 | 11,266 | 7,412 | |
| - Current transfer | 171,390 | 343,873 | 413,602 | 1.203 |
| - Miscellaneous | 990 | 5,310 | 6,602 | |
| Capital Operation | 4,883 | 17,079 | 84,429 | 4.943 |
| - State bonds | 3,345 | 15,574 | 84,062 | 5.398 |
| - Transfer of goods | 650 | 1,236 | 377 | |
| - Transfer of capital | 887 | 36 | - | |
| - Miscellaneous | - | 230 | - | |
| Total | 243,285 | 524,867 | 681,148 | 1.298 |

Note: This data was obtained from the working basis values in Balanço Geral 1994, 1995 Governo do Estado do Tocantins, Sistemas do Acompanhamento das Acoes Governamentais 1996.

Table V – 2.3(3) Fiscal Expenditure of the State Government of Tocantins

Unit: In thousand R\$

| Items | 1994 | 1995 | 1996 | Growth 96/95 |
|---------------------------------------|---------|---------|---------|-----------------|
| Current expenditure | 209,766 | 371,417 | 391,808 | 1.055 |
| - Salaries | 132,893 | 253,564 | 246,667 | 0.973 |
| - Interest on domestic bonds | 1,546 | 16,062 | | |
| - Interest on international bonds | 42 | 569 | 25,665 | 1.543 |
| - Miscellaneous | 75,285 | 101,217 | 119,476 | 1.180 |
| Capital Expenditure | 130,251 | 153,844 | 234,868 | 1.527 |
| - Investment | 110,268 | 127,455 | 229,129 | 1.798 |
| - Amortization of domestic bonds | 16,122 | 24,016 | 5,739 | 0.239 |
| - Amortization of international bonds | 0 | 0 | 0 | |
| - Miscellaneous | 0 | 0 | 0 | |
| Total | 340,017 | 525,261 | 626,676 | 1.193 |

Table V – 2.3(4) Expenditures of Government Office by Bureau

Unit: In thousand R\$

| Bureau | Amount |
|------------------------------|---------|
| Legislation | 14,287 |
| Legal affairs | 35,129 |
| Government administration | 576,260 |
| Administration and planning | 54,750 |
| General affairs | 3,136 |
| Finance | 23,733 |
| Education and culture | 122,341 |
| Insurance | 50,565 |
| Public security | 8,087 |
| Agriculture | 8,380 |
| Industry & commerce, tourism | 1,886 |
| Transport & public works | 210,702 |
| Political affairs | 1,984 |
| Labor & social action | 20,502 |
| Others | 71,18 |
| Total | 626,676 |

ANNEX VI

EXISTING AGRICULTURAL AND LIVESTOCK CONDITIONS

ANNEX VI

EXISTING AGRICULTURAL AND LIVESTOCK CONDITIONS

1 Agricultural Production

1.1 Agricultural Production in the State

Rice is the major crop cultivated in the State of Tocantins followed by other crops such as maize, cassava, soybean, feijão bean, banana, sugarcane, banana and pineapple. The cropping area and the production for these major crops are shown below.

Agricultural Production in the State (1995/96)

| Crop | Area (ha) | Yield (t/ha) | Production (t) | Number of Producers |
|----------------------|-----------|--------------|----------------|---------------------|
| Rice (Non-Irrigated) | 74,630 | 1.39 | 103,919 | 12,532 |
| Rice (Irrigated) | 53,629 | 4.14 | 222,214 | 284 |
| Maize | 69,049 | 1.86 | 128,739 | 11,887 |
| Feijão Bean | 5,684 | 0.29 | 1,628 | 4,132 |
| Soybean | 7,292 | 1.92 | 14,030 | 58 |
| Cassava | 11,034 | 17.81 | 196,505 | 13,047 |
| Sugarcane | 5,334 | 46.72 | 249,201 | 1,318 |
| Banana (*) | 6,487 | 0.64 | 4,156 | 3,264 |
| Pine apple | 585 | 22.06 | 12,905 | 330 |

* - The unit for the production and yield for banana is 1000 bunches

(Source FSEPLAN Data-95/96)

Apart from the above mentioned fruits, orange, cashew and acerola are also cultivated in small areas. The total cultivation area for various crops during various periods are shown in the following table.

Cultivation Area (ha) in the State during Various Periods

| Crop | 1985 | 1989 | 1995 | 1996 | 1996/ 1995 (%) | 1996/ 1989 (%) |
|-------------|---------|---------|---------|---------|----------------|----------------|
| Rice | 323,234 | 381,260 | 167,313 | 128,289 | 76.7 | 33.6 |
| Maize | 84,498 | 102,530 | 75,105 | 69,049 | 91.9 | 67.3 |
| Feijão Bean | 18,653 | 10,480 | 8,106 | 5,684 | 70.1 | 54.2 |
| Soybean | 27,140 | 59,070 | 20,007 | 7,292 | 36.4 | 12.3 |
| Cassava | 12,244 | 10,120 | 11,476 | 11,034 | 96.1 | 109.0 |
| Sugarcane | 2,801 | 5,910 | 5,553 | 5,334 | 96.1 | 90.3 |
| Banana | 15,200 | 14,570 | 8,749 | 6,487 | 74.1 | 44.5 |

(Source : IBGE Data)

While comparing the cropping area according to the zones, it is inferred that more than 90% of the irrigated rice is cultivated in south-western zone specially in Formoso do Araguaia and Lagoa da Confusão. Sugarcane is cultivated mainly in the south-eastern region (mainly Aurora do Tocantins) which contributes about 90% of the sugarcane production of the State. Pineapple is cultivated mainly in the Central region especially Miracema do Tocantins and Palmas. The agricultural production in the Tocantins State is compared with the Northern region and Brazil as shown below.

Comparison of Agricultural Production of the State of Tocantins with Northern Region and Brazil (1994-95)

| Crop | Percentage of Area | | Yield (t/ha) | | |
|----------------|-------------------------------|----------------------|--------------|--------------------|----------------------|
| | Tocantins/ Northern Region | Tocantins/ Brazil | Tocantins | Northern Region | Average in Brazil |
| Rice | 29.7 | 3.76 | 2.49 | 1.77 | 2.38 |
| Maize | 11.8 | 0.48 | 1.49 | 1.52 | 2.36 |
| Feijão Bean | 3.0 | 0.15 | 0.35 | 0.55 | 0.62 |
| Soybean | 100.0 | 0.27 | 1.81 | 1.91 | 2.16 |
| Cassava | 2.41 | 0.51 | 16.73 | 14.12 | 13.22 |
| Sugarcane | 29.1 | 0.11 | 49.22 | 50.87 | 67.23 |
| Banana (*) | 11.3 | 1.99 | 0.65 | 1.13 | 1.11 |
| Pineapple (**) | 15.0 | 1.00 | 18.01 | 20.79 | 22.34 |

* - Yield for Banana is given in 1000 bunches/ha

** - Yield for pineapple is given in 1000 fruits/ha.

(Northern region includes Amazonas, Pará, Roraima, Acre, Amapá, Rondônia and Tocantins)

(Source: Statistical year book of Brazil - 1995)

1.2 Agricultural Farm Structure (Landholding Size)

In the State of Tocantins there are approx. 47,000 farmers cultivating a total area of approx. 235,000 ha, with an average cultivation area of 5.0 ha/farmer.

In the State of Tocantins, the farmers are classified based on their income and their landholding size as shown below. These classifications are followed by the banks while giving the credit for the farming activities :

1) Classification according to the Central Bank

1. Mini Farmer: Gross annual income of up to R\$7,500
2. Medium Farmer: Gross annual income of R\$7,500 - R\$22,000
3. Large Farmer: Gross annual income of above R\$22,000

2) Classification according to FNO (North Constitutional Fund)

a) Classifications according to gross value of production

1. Mini Farmer : Gross value of production of up to R\$14,000
2. Small Farmer : Gross value of production of R\$14,000 - R\$58,000
3. Medium Farmer : Gross value of production of R\$58,000 - R\$288,000
4. Large Farmer : Gross value of production of above R\$288,000

b) Classification according to landholding size

1. Mini Farmer : Up to 240ha
2. Small Farmer : 240-640 ha
3. Medium Farmer : 640-1,200 ha
4. Large Farmer : Above 1,200 ha

(For the areas of Araguaçu and Sandolândia, 7/8th of the above values are used for classifying the farmers according to their landholding sizes. For the inundated areas, the sizes of the above mentioned areas are multiplied by 2).

3) Classification according to INCRA (National Institute for Colonization and Agrarian Reform)

1. Mini Farmer : Up to 80ha
2. Small Farmer : 80-320 ha
3. Medium Farmer : 320-1,200 ha
4. Large Farmer : Above 1,200 ha

As for the PRONAF (National Support for the Familiar Agriculture), the small farmer is defined as follows:

1. Landholding area shall be less than 240 ha
2. Number of workers - 2
3. The family should live in the farm or nearby area and not in the town.
4. 80% of the income shall come from agriculture

The limits of banking credits through various programs of agriculture and animal husbandry are decided based on the above classification.

2 Present Conditions of Farming

2.1 Cultivated Crops and their Cultivation Techniques

Most of the small farmers own a relatively large area of land, although they cultivate upland rice, feijão bean, cassava, etc., only for subsistence purposes in small areas. Each crop is cultivated in a small field and is left fallow during the following year. In the following year, they burn the next field and sow seeds or plant stocks among the burned stubs. Generally, it takes about 4 to 5 years to return to the primary field. However, few small farmers introduce cash crops such as vegetables and fruit trees, and cultivate various crops in the same field through crop rotation method.

Most of the farmers do not have any irrigation facility. Therefore, annual crops are cultivated in wet season and crops are grown over several seasons. Cassava and fruit trees, for instance, have minimal growth in dry season and restart the growth in wet season. Vegetables which are cultivated in wet season are kept under roof of polyethylene sheets (guidance of RURALTINS).

RURALTINS provides the technical guidance to farmers, which is based on EMBRAPA guidance. However, yields of many crops are low and corresponds to 56 % to 83 % of the average yields in Brazil except for rice and cassava.

Most of the soils in Tocantins are cerrado-soils, which require improvement of soil acidity for crop cultivation. RURALTINS measures pH of soils and shows the amount of lime required to improve farmer fields, recommending lime application once in every 4 years.

2.2 Change of Yields in the Last Five Years

It is considered that the main factors affecting the yield are veranico from January to February, which is a short draught of about 20 days, and wet injury from April to May, when the ripening stage and maturing stage of maize, 2nd feijão bean and upland rice are taking place. The relationship between changes of each crop yields and the weather conditions could not be clarified because of non-availability of the necessary meteorological data in the State of Tocantins.

According to RURALTINS, the main factors which caused the decrease in yield of each crop in the last five years are shown in following Table.

| Crops | 1993/94 | 1994/95 | 1995/96 | 1996/97 |
|-------------|---|---|--|-----------------------------|
| Soybean | Much rain in Harvest period | - | Veranico | Much rain in Harvest period |
| Maize | - | Much rain in Pre-harvest period | - | - |
| Feijão Bean | Damage caused by White Fly (Mosca Branca) | Damage caused by White Fly (Mosca Branca) | - | - |
| Upland Rice | Veranico | Veranico | - | - |
| Paddy Rice | - | Much rain in Harvest period | Damage caused by grass-hoppers, and Veranico | Much rain in Harvest period |

As shown in this Table, the crops in the State of Tocantins had suffered from weather disasters in every year during the last five years.

The damage of Veranico in crop cultivation can be prevented by engineering and agriculture technologies. The engineering methods to control Veranico include the introduction of irrigation facilities and the improvement of water holding capacity of soil. On the other hand, agricultural technologies to control Veranico are the selection of varieties and the improvement of cropping patterns to avoid damages in the weaker stages of crop growth.

2.3 Considerations

The following considerations were made on the present conditions of farming in the State of Tocantins :

- 1) Actual farming types in the State of Tocantins are divided into two types, namely, enterprise farming by medium and large scale farmers in new developed fields and slash and burn farming for subsistence in small areas carried out by small scale farmers. Once poverty of landless farmers, marginal farmers and small farmers is becoming a serious social problem, the Federal and the State Governments are attempting to increase their incomes and improve their living standards through loan systems.
- 2) Improving the small farmers incomes up to the level of the medium scale farmers may solve the social problem, and may result in an effective use of credits and finally may contribute to the growth of agriculture in Tocantins. That is to say, small farmers are the backbone of agriculture of the State in future.

In order to progress from small farmer to medium farmer, at first, all the land owned by the small farmer except the protected area should be cultivated, by introducing crops with commercial potential and cultivated through scientific rotation method. In the new field, small farmers should exert themselves to increase yield reckoning on technical assistance from RURALTINS, also preventing environmental damages and degradation of soil.

- 3) The new small farmers with medium farmer income level should engage in sustainable farming with due consideration to the use of animal manure, compost and green manure of leguminous crops, and prevention of soil degradation by sod-seeding cultivation and cover cropping, and ecological control of insects and diseases. These new technologies on sustainable farming are now studied in EMBRAPA and by the JICA technical assistance team (EMBRAPA) in Brazil.

With regard to the new small farming, it may be considered that there may be two types as follows: one type is the combination of cereals production with beef cattle production, and the other type is the combination of vegetables and fruits production with pig raising and poultry farming in the suburbs of towns.

For each of these farming types, suitable location arrangements should be considered. For example, the farming type of vegetables and fruits cultivation combined with pig and poultry raising shall be located on green belts on the suburbs of towns.

Furthermore, irrigation facilities are required for the new small farmers in order to allow the cultivation during the dry season and thus expanding the actual cultivated land.

- 4) There are many problems to upgrade the small farmers' incomes up to the level of the

medium scale farmers, namely;

1. How to develop with cheap cost : If farmers fall into much debt, the development ends up in a failure.
2. How to transfer high technologies to small farmers who present high illiteracy rate: training of farming practices for farmers and youths through associations is required. The associations should be organized and machinery and facilities should be used in a collective way through these associations.
3. Research institutes will play an important role on the development of new technologies, such as new varieties suitable to Tocantins conditions, new technologies on sustainable farming, etc. UNITINS should be strengthened through the provision of facilities, equipment and buildings. RURALTINS should also be strengthened so that both organisms can carry out the extension activities more effectively.

3 Agricultural Management Conditions

3.1 Class Division

The farms size and the corresponding number of farms in the State of Tocantins are shown below:

| Division | | Number | % | Area | % |
|----------|------------------|----------|--------|-------------|--------|
| (A) | ~10ha | 3,603 | 7.6 | 18,672 | 0.1 |
| | 10 ~ 50ha | 9,415 | 19.9 | 285,819 | 1.6 |
| | 50 ~ 100ha | 7,582 | 16.0 | 571,360 | 3.3 |
| | (Sub-total) | (20,600) | (43.5) | (875,851) | (5.0) |
| (B) | 100 ~ 500ha | 19,356 | 40.9 | 4,374,293 | 25.2 |
| | 500 ~ 1,000ha | 3,835 | 8.1 | 2,698,757 | 15.6 |
| | (Sub-total) | (23,191) | (49.0) | (7,673,050) | (40.8) |
| (C) | 1,000 ~ 5,000ha | 3,208 | 6.8 | 6,178,956 | 35.6 |
| | 5,000 ~ 10,000ha | 234 | 0.5 | 1,574,142 | 9.1 |
| | 10,000ha ~ | 87 | 0.2 | 1,652,406 | 9.5 |
| | (Sub-total) | (3,592) | (7.5) | (9,405,504) | (54.2) |
| Total | | 47,320 | 100.0 | 17,354,405 | 100.0 |

- (1) In this state, the agricultural activities are not fully active, therefore the area size doesn't directly reflect the economic conditions, which are not clear from the class division.
- (2) Having a livestock population 5 times bigger than the human one, many parts of the state have the animal husbandry as the main source of income. In terms of area, it corresponds to the class (C) in the table before presented and can be considered

as a large farm..

- (3) Class B corresponds to small farmers and the present area is not enough to generate income through extensive animal husbandry, although it has potential with future mechanization.

The PRONAF considers, in dividing the classes, that a small farm, which is apt to receive their assistance, corresponds to 4 fiscal modules summing up to 320 ha, and above that, it is already considered as a medium farm.

- (4) Below 100 ha, class (A), the farm is considered as small or mini farm. This area is not enough for individual mechanization, requiring the creation of associations to allow mechanized cultivation. Another alternative could be intensive agriculture in order to increase the income even in small areas.
- (5) Actually, the big farmers included in class (C) can produce cereal and the bottom band of (B) can produce other cultures or intensive animal husbandry of small animals. Therefore, the above table can be utilized only as a reference.

3.2 Present Situation and Management of Each Class

- (1) The big farmers (C) can realize a good management of their farms, improving their pasture and facilities, introducing better varieties to increase the productivity.

Among the medium and small farmers, there are farmers who carry out the extensive pasture decreasing the productivity. The lands where the utilization level is low or belong to INCRA, or still have high taxes, should increase the cereal production.

- (2) The medium farmers are the landowners, who generally carry out extensive animal husbandry and subsistence production, and in this sense are not different from the small farmers. It can be stated that the low knowledge and engagement in the agriculture may be the main cause for this situation. As for the priority plans, it is necessary to produce a new generation through educating young people about the importance of agriculture, mechanization and leadership capability in projects. These young people will have a fundamental role in the agriculture production.
- (3) Mini farmers (A) should be included in the NPA plans, facilitating their access to technology, market and finances. Even without sufficient area it is possible to rent those lands. It can be accounted that the young people engaged in the NPA plans can be included in the mechanization projects.

4 Agricultural Credit Conditions

4.1 Present Conditions of Agricultural Credit

In the State of Tocantins, all the agricultural credit operations are executed by the Bank of Brazil and Bank of Amazon. The execution conditions of each bank agricultural credit are as follows:

Bank of Amazon (FNO) 1995

| | PROCERA | | PRORURAL | | NORMAL | | TOTAL | |
|-----------|---------|----------|----------|----------|--------|----------|--------|-----------|
| | No | R\$x1000 | No | R\$x1000 | No | R\$x1000 | No | R\$x1000 |
| Total (1) | 1,721 | 6,181.1 | 9,182 | 88,036.5 | 2,548 | 110,343 | 13,451 | 204,560.4 |
| State (2) | 192 | 626.2 | 306 | 2,746.6 | 837 | 44,924.1 | 1,335 | 48,296.9 |
| (2)/(1)% | 11.1 | 10.1 | 3.3 | 3.1 | 32.8 | 40.7 | 9.9 | 23.6 |

Bank of Brazil (1996)

| | Agriculture | | Live Stock | |
|-----------|-------------|---------------|------------|--------------|
| | No | R\$ | No | R\$ |
| Tocantins | 1,547 | 60,530,139.68 | 111 | 2,376,612.33 |

The Bank of Amazon executes the financing operations of PROCERA for INCRA settlements, PRORURAL for small farmers and NORMAL for medium and large farmers, respectively. Among the seven states where this bank operates, the State of Tocantins accounts for 23.6% of the financed amount. Financing for small farmers or PRORURAL for Tocantins reach only 3%, either in number of operations or in value, demonstrating the difficulty of access for the small farmers to this financing sources.

While comparing the financing operations by sector, it is verified that the financing value of the Bank of Brazil for agriculture activity is higher than for livestock. Even after withdrawing the 40 operations summing up to a value of R\$ 37 millions for PRODECER III initiated in 1996, there is a remaining of R\$ 23 millions for 1,500 operations. Considering the 40 thousand farmers in the State of Tocantins, the loan utilization rate, in quantity or amount is still low, taking into account that the Bank of Brazil is the main agriculture financing agent of the government.

After the stabilization of the economy, the fixed financing interest rate for agricultural support decreased from 12% to 9.5%. In case of financing such as FNO, there is a discount in the TJLP for the Amazon region and for small farmers. With a high initial investment, the charges taken by PRODECER III are remarkable and as a consequence, it is being difficult to cover the debts. PRODECER III is one of the few projects in the state which supports medium farmers, therefore it is necessary to take some prevention measures against the high interest rates.

4.2 Acquisition Method of Agricultural Credit

The majority of agricultural credits are destined to large farmers (cattle raising farmers) and do not cover the demands of medium farmers, an important group for the development of the state, also making the access difficult for the small farmers. With a high illiteracy rate and low productivity, small farmers are assisted by RURALTINS in the elaboration of drawings and documents necessary for the obtainment of credit, however due to the reduced staff, demands are not completely fulfilled. Another barrier found for acquisition of credit is the lack of property documents necessary to certify real ownership of the land, an essential requirement to obtain bank credit. And, the guarantee of 130% is too heavy for small farmers.

In 1996, through a national policy on favor of small farmers, 1,800 farmers applied for financing assistance, however only 790 farmers had their application forms approved. Therefore, training of small farmers association leaders and strengthening of RURALTINS structure is an important step to facilitate the access to financing sources.

4.3 Agricultural Credit Programs and their Rules of 96/97

Many different financing programs are found in the state. Besides the national programs, regional, state and programs of INCRA are also found, making it more complex. Each program is defined as follows:

- **National Level**

At the national level, there are yearly financing resources for planting, such as PROGER-RURAL, EGF/SOV, Finame Agrícola-PAI and PRONAF. The Federal Government has a future intention to strength the PRONAF, which is addressed to small rural farmers, aiming to balance the income differences found at present. Furthermore, there are credits granted to the Agrarian Reform Settlers such as PROCERA, ALIMENTATION CREDIT, PRODUCTION FOSTER CREDIT and HOUSING CREDIT.

- **Regional Level**

At the regional level, incentives are given by SUDAM and financed by the BASA, an organism responsible for the management of the Amazonia Legal and the FNO. The FNO is composed of two types of financing lines: the special one exclusively addressed to small farmers and the normal one which is addressed to large farmers.

- **State Level**

As for state financing programs, the PRODIVINO includes funding for the associations of small farmers. In 1997, the State of Tocantins is establishing the Development Bank, avoiding direct finances.

- **Special Programs**

As special program, there is the PRODECER which is financed by JICA and Brazilian Government.

4.3.1 National Level Programs

(1) CUSTEIO AGRÍCOLA - Agricultural Production

Purpose: Acquisition of supplies, support for planting and harvesting (Agriculture) and maintenance (Livestock).
Limit: R\$ 150,000 for cultivation of rice, feijão beans, cassava, corn and wheat.
R\$ 300,000 for cultivation of cotton
R\$ 30,000 for cultivation of soybean and remaining crops.
Charges: Fixed interest, 12% yearly
Beneficiary: Farmer and rural farmers' organizations

(2) PROGER-RURAL - Generation of Employment and Income Program

Purpose: Investment (machinery and implements recorded by FINAME) and agricultural production cost .
Limit: R\$ 48,000 for investments and R\$ 30,000 for agriculture
Charges: TJLP + 6% yearly for investments and
16% yearly for agricultural production.
Beneficiary: Owners of areas smaller/equal to 4 fiscal modules (320 ha.)

(3) EGF/SOV - Federal Government Loan/ without selling options

Purpose: Covering of commercialization cost
Limit: R\$ 150,000 for rice, feijão beans, cassava, corn and wheat.
R\$ 300,000 for cotton, and R\$ 30,000 for the remaining crops
Charges: Fixed interest, 12% yearly
Beneficiary: For farmers who have decided to wait for better prices after harvesting.

(4) FINAME-AGRÍCOLA - Special Agency of Industrial Financing

Purpose: Supply of machinery and equipment for rural agricultural use
Limit: Limited up to 80% of the acquired good
Charges: TJLP + 3,5% yearly + 2,0% yearly.
Beneficiary: Rural producer and cooperatives

(5) FINAME-AGRICOLA - PAI - Integrated Amazon Program

Purpose: Supply of Tractors and harvesting machinery
Limit: not defined (It is not under execution yet)
Charges: 16% yearly.
Beneficiary: Rural farmers

(6) PRONAF - National Program of Familiar Agriculture Strengthening.

Purpose: Fixed investments and production cost for farmers or organization of rural families. Infrastructure investment for the municipality.

Limit: R\$ 5,000 for agricultural cost
R\$ 15,000 for investments
R\$ 75,000 for organizations, and
According to the projects for the municipality.

Charges: 9% yearly for production cost and TJLP + 6% for fixed investments. In case of municipality, there is a variation from 5% to 40%.

Beneficiary: Agricultural families.

4.3.2 Regional Level Programs

PAI - Integrated Amazon Program

Purpose: Fixed investments for agriculture, aquaculture and environment

Limit: Limited up to 80% of the agriculture and aquaculture projects and 85% for preservation of environment.

Charges: TJLP + 0.5% yearly + 3.5% yearly for mini or small farmers
TJLP + 1% yearly + 3.5% yearly for medium or large farmers

Beneficiary: Rural farmers and cooperatives

4.3.3 Programs related to FNO - North Financier Constitutional Fund

(1) PROCERA - Special Credit Program for Agrarian Reform

Purpose: Fixed, Semi fixed Investment and agricultural production cost.

Limit: R\$ 7,500 (investment) and R\$ 1,000 (production cost) per beneficiary.

Charges: 12% yearly, with discount of 50% on the main and charges.

Beneficiary: Farmers settled by INCRA.

(2) PRORURAL - Production Support of the Small Organized Rural Family Program

Purpose: Fixed, Semi-fixed investments and production cost

Limit: R\$ 12.000,00 per beneficiary

Charges: TJLP + 4%, with discount of 45% or 60% at the TJLP.

Beneficiary: Micro or Small farmers organized in association.

**(3) PRODEX - Extrativism (forest products collection)
Development Support Program**

Beneficiary: Micro and small farmers and associative organizations
of rural production
Other Items: Same as PRORURAL

(4) PRODAGRI - Agriculture Development Support Program

Purpose: Fixed, Semi Fixed investment and production cost.
Limit: R\$ 48,000 (mini), R\$ 120,000 (small), R\$ 800,000 (medium)
and R\$ 1,200,000 (large).
Charges: TJLP + 6% yearly with discount at the TJLP from 0 to 50%
Beneficiary: Farmers, associations and cooperatives of farmers.

(5) PRODEPEC - Livestock Development Support Program

Purpose: Livestock Sector
Charges: TJLP + 6% yearly with discount at the TJLP from 0% to 30%
Other Items: Same as PRODAGRI.

**(6) PROMICRO - Micro Enterprises and Agriculture
Industries Support Program**

Purpose: Fixed and semi fixed investments, and operational capital
Limit: R\$ 36,000
Charges: TJLP + 4% yearly with discount of 40% of the TJLP
Beneficiary: Mini Enterprises, associations and production cooperatives

4.3.4 Special Finance

**PRODECER III - Program for the Development of Cerrado
- Stage III.**

Purpose: Fixed investment and production cost
Limit: Value stipulated in the project
Charges: TJLP + 6% yearly
Beneficiary: Farmers of PRODECER and their organizations

4.3.5 State Level Programs

PRODIVINO - Saint Spirit Social Program

| | |
|--------------|----------------------------|
| Purpose: | Supply of Tractors |
| Limit: | R\$ 30,000 per beneficiary |
| Charges: | 12% yearly |
| Beneficiary: | Farmers Associations |

4.3.6 Special Programs / INCRA Settlements

(1) **PROCERA - Special Credit Program of the Agrarian Reform**
Same as PROCERA/FNO

(2) **ALIMENTATION CREDIT**

| | |
|--------------|---|
| Purpose: | Supply of resources for acquisition of food |
| Limit: | R\$ 340 |
| Charges: | TJLP + 6% yearly, with discount of 50 % |
| Beneficiary: | Settled farmers registered by INCRA |

(3) **PROMOTION OF PRODUCTION CREDIT**

| | |
|-----------|--|
| Purpose: | Acquisition of inputs, tools and agricultural implements |
| Limit: | R\$ 740 |
| The rest: | The same as Alimentation Credit |

(4) **HOUSING CREDIT**

| | |
|-----------|--|
| Purpose: | Construction of houses for settled farmers |
| Limit: | R\$ 2,000 |
| The rest: | The same as Alimentation Credit. |

4.4 Security Policy

1. **Definition:** It is a rural credit rent extension procedure, except EGF/COV, and values under the procedures of PROAGRO which was created by law 9.138 from November 28th, 1995.
2. **Limit:** R\$ 200,000; higher amounts are directly negotiated with the financial agent.
3. **Beneficiary:** Farmers, associations and production cooperatives.
4. **Validity:** agreement executed up to June, 20.1995
5. **Charges:** 3% yearly + product equivalency; 2 to 3 years of grace period and 7 to 10 years to cancel; **Expiration:** first in October, 31.1997 (For security with 7 years) or October, 31 1998 (For over 7 years)
6. **Payment:** In current money or in products, according to the agreement. The products shall be rice, feijão beans, cotton, maize, wheat or soybean, for the corresponding

cereal farmers, and maize and soybean for the remaining farmers, including livestock farmers.

The amount secured in the State, by the main financial agents is as follows;

| Bank | No. of Operations | Amount (R\$) |
|----------------|-------------------|--------------|
| Amazon Bank | 1,952 | 117,980,918 |
| Bank of Brazil | 1,019 | 73,460,864 |

4.5 PROAGRO (Agriculture and Livestock Guarantee for 96/97)

1. Purpose: Insurance of farmers investments from losses coming from rural activities.
2. Limit: Established in 70% of proposed with increase of 10% for each prior year which does not have concession of the insurance, limit to the last 3 crops period.
3. Covering: Upland crops; hailstorm, storms and dryness
Irrigated crops; hailstorm, storm
4. Manager: Banco do Brasil
5. Reward: According to the activities and implantation conditions.
6. Beneficiaries: Farmers

PROAGRO Aliquots by Zoning

| Types | Without adhesion to the zoning | With adhesion to the zoning |
|------------------------------------|--------------------------------|-----------------------------|
| Feijão beans (without Irrigation) | 11.7% | 6.7% |
| Corn, Soybean (without Irrigation) | 7.0% | 3.9% |
| Sugar cane (without Irrigation) | 7.0% | 3.9% |
| Others (without Irrigation) | 7.0% | 3.9% |
| Irrigated crops | 4.7% | 1.7% |
| Livestock | 1.2% | |
| PRONAF/PROCERA (INCRA settlements) | 2.0% | |

(Restrictions)

1. High system cost
2. Short item covered
3. Only one agriculture insurance
4. Indemnification procedures are highly bureaucratic and morose
5. It really insures the bank operation but not the rural activity
6. The financial agents are not promoting the program
7. Financial agents try to avoid insurance of upland crops which represents higher production risk likewise the option of PROAGRO
8. It is a program in study stage with probability of big changes

4.5.1 Agricultural Zoning

This work is executed by EMBRAPA (Brazilian Agricultural Research Agency) in charge of classification of the different climates suitable for each crop in upland conditions establishing the planting period through edaphological and climatic studies (daily precipitation, potential evapotranspiration, available water according to roots depth) and crops (crops coefficient, phenologic phase of crops, roots depth) utilizing 10 years ago data.

For Tocantins state, the defined crops according to this classification are rice, feijão beans, maize and soybean.

4.6 Credit Conditions for 97/98 and Others

4.6.1 Explanation of the Agricultural Minister

According to the Agricultural Ministry's officials, in May of 1997, the Government participation in Agricultural credit was going to be decreased, excluding PRONAF and others. But in June, the Government presented an improved policy for the agricultural credit, showing, at the end, enormous desire to develop the agricultural sector. The Minister of Agriculture and Supply explanation is presented as following announcement.

"The Federal Government announces the harvest plan 1997/98, which keeps the engagements of the president Fernando Henrique Cardoso with the agricultural sector. This announcement anticipates the rules with which the producer can calmly plan and execute his maintenance, financing and commercialization actions. For the second consecutive year, there will be more credit available, at lower costs, increasing the support to crops, which demand more labor-force.

The paradigms "Productivity and Quality make the Agriculture Real" were kept. It means the emphasis is on four combined actions: soils reclamation; crops rotation; direct planting (reducing 1% more of the rural insurance); and reduction of losses, increasing the productivity, and resulting in more direct income to the producer and his family, without pressing the living costs indexes.

The familiar agriculture, which in the last year contracted R\$ 574 millions of Reals, serving more than 300 thousand families, will have R\$ 1.65 billion in credit. The goal is to reach 500 thousand families in this harvest, assuring to them technical assistance and rural extension subsidized by the Federal Government, through the State Secretariats of Agriculture and EMATERs. Other news;

1. widening of the agroclimatic zoning which indicates where, when and what to plant. If the producer follows the indications, the agricultural insurance is reduced up to 50%. There was also a reduction in the interest rates from 12% to 9.5% (commercial agriculture), and from 9% to 6.5% (familiar agriculture);

2. increase of the agricultural expenses credit in 60% (from R\$ 5.2 to R\$ 8.5 billions); increase in the agricultural expenses limit, including livestock (bovine, swine and others), aiming at the production increase and at generating surplus.

In announcing the rules, the Ministry of Agriculture express the President Fernando Henrique's desire in reducing the rural activities costs, increasing the producer income, while supports and gives priority to agriculture and livestock raising activities, generating source of wealth, work and dignity for thousands of families."

4.6.2 Main Alterations in the Harvest Plan

| 1996 | 1997 |
|--|--------------------------------------|
| <u>Interest Rates</u> | |
| from 12% to 9% (PRONAF) | From 9.5% to 6.5% (PRONAF) |
| <u>Credit</u> | |
| R\$ 5.2 billions | R\$ 8.5 billions |
| R\$ 574 millions (PRONAF) | R\$ 1.65 billions |
| <u>Investment</u> | |
| limit of R\$ 30 thousand | R\$ 40 thousand |
| <u>Agricultural Expenses</u> | |
| sorghum - maximum limit of R\$ 30 thousand | R\$ 150 thousand (Center-South) |
| soybean - maximum limit of R\$ 30 thousand | R\$ 100 thousand (Center-West/North) |
| livestock/others - limit of R\$ 30 thousand | R\$ 40 thousand |
| <u>PROAGRO (aliquot)</u> | |
| cotton - from 7% | to 3.9%, with zoning |
| Reduction in 1% more of the PROAGRO for feijão beans, maize and soybean for those who utilize the zoning with direct planting. | |
| <u>Minimum Price</u> | |
| cotton seed - R\$ 6.5 | R\$ 7.00 (+7.7%) |
| plume - R\$ 23.15 | R\$ 24.50 (+5.8%) |
| feijão beans - R\$ 25.20 | R\$ 26.00 (+ 3.17%) |
| soybean - R\$ 8.88/7.98 | R\$ 9.50/8.50 (average 6.7%) |
| sorghum - R\$ 4.68 | R\$ 4.69 (+ 0.13%) |
| Rice - correction in the table, in 1997, which represented a readjustment of 6%. | |
| Cassava - average readjustment of 4.2% for roots, flour and starch. | |
| Maize - In the Center-West, the government valorizes the production of cotton, rice and soybean, keeping the present levels of maize production. | |

Observation: The State of Tocantins is situated in the north region, which included soy bean credit expansion area.

4.6.3 Agricultural Financing

The interest rates for agricultural expenses and investment, with rural credit controlled resources, changes from 12% to 9.5% in loans up to R\$ 40 thousand. Within this value all the crops, livestock activity, and financing for lime necessary for soil correction are

included. Another new; the producer can finance several crops, without surpassing the maximum limit of financing range in which he is included.

The financing limit for those planting rice, feijão bean, cassava, maize, wheat and sorghum is up to R\$ 150 thousand (interest rate of 9.5%). For those planting cotton, the limit of R\$ 300 thousand was kept and, for soybean producers, financing up to R\$ 100 thousand (it was R\$ 30 thousand in the last harvest) in the Center-Western and Northern States.

4.6.4 Familiar Agriculture

The producer eligible to the National Program of Familiar Agriculture Strengthening (PRONAF) reckons on a differentiated agricultural policy; the agricultural expenses interest rate was reduced from 9% to 6.5%, and the resources were raised from R\$ 574 millions to R\$ 1.65 billions, out of which R\$ 650 millions are for investments.

The criteria for the producer to be classified as a familiar agriculture producer are; to utilize the direct labor force of his family plus up to 2 employees; not possessing a land larger than 4 fiscal modules (25 to 100 ha); at least 80% of the income have to originate from the rural activity; and the family must live in the property itself or in a nearby urban/rural community.

For these producers, the equivalence-product system is still in force, i.e., the producer can repay his loan with product (maize, feijão beans, etc.). His limits are; agricultural expenses - R\$ 5 thousand, and investment - R\$ 15 thousand/borrower. For the collective loans (for associations or groups), the financing limit is R\$ 75 thousand, respecting the individual limit of R\$ 15 thousand.

4.6.5 Agricultural Zoning / Direct Planting

The agricultural zoning system for planting is in force since the last harvest for maize, rice, feijão beans, soybean and wheat, and cotton for Paraná State. Therefore, the cotton aliquot in the PROAGRO (rural insurance) was reduced from the present 7% to 3.9% (40%). The zoning results are being very positive, therefore the Ministry of Agriculture is improving the system for other crops and states. Furthermore, to stimulate the direct planting technique within the zoning, there will be a reduction of 1% in the PROAGRO aliquots charged in the feijão bean (6.7%), maize (3.9%) and soybean (3.9%) crops.

4.7 Minimum Prices

In the harvest 97/98, some minimum prices were readjusted; to stimulate the recovery of cotton crop, the minimum price of cotton seed had a readjustment of 7.7%, in the whole country (from R\$ 6.5 to R\$ 7.00/arroba-15 kg), and the plume cotton was readjusted in 5.83%, from R\$ 23.15 to R\$ 24.50/arroba.

The rice, which in the beginning of the year had a correction in the classification table, was readjusted in average in 6%. The readjusted price is; the irrigated husk rice is

R\$ 10.53/50kg bag, in the whole country. The Southern, Southeastern, Northeastern and Center-western (except Mato Grosso State) upland rice costs R\$ 9.30/60kg bag, and in Mato Grosso and Tocantins, it costs R\$ 8.97/bag. The Northern upland rice (except Tocantins) costs R\$ 8.46/bag.

In the Center-South region, the 60 kg bag of colored or black feijão bean was readjusted in 3.17%, raising from R\$ 25.00 to R\$ 26.00. The ton of cassava was increased in 4.17%, raising to R\$ 25.00.

The government has established a differentiated policy for maize, showing signs that it intends to increase the soybean production and keep the maize production in the same production levels in the Center-West region. In the states of Goiás, Mato Grosso do Sul and Federal District, the price was reduced in 3.01% (from R\$ 6.70 to R\$ 6.50). The same happened in the states of Mato Grosso, Acre and Rondônia; from R\$ 6.30 to R\$ 6.00. Also for this reason, the maize price in the South and Southeast regions, Tocantins, and south of Bahia, Maranhão and Piauí states is being kept at R\$ 6.70/60kg bag.

The soybean has increased over 6% in all these regions; 6.96% in the South, Southeast, and Center-West regions (except MT), reaching R\$ 9.50/60 kg bag. In the states of Mato Grosso, Pará, Tocantins and Northeast states, the increase was of 6.7%, reaching R\$ 9.00/bag. In the states of Amazonas, Acre and Rondônia, the increase was of 6.54%, reaching the price of R\$ 8.50/bag.

4.8 New Operational Conditions, in force from 09/Jan/97 on, for Financing Programs for the Rural Sector (FNO)

(1) Size Distribution

| DISCRIMINATION | MINI | SMALL | MEDIUM | LARGE |
|--|--------------|-------------------|--------------------|-----------|
| 1 - Size (the largest of the below parameters) | | | | |
| a) Annual Gross Income - R\$ 1.00 | up to 17,500 | > 17,500 ~ 72,500 | > 72,500 ~ 360,000 | > 360,000 |
| b) Fiscal Module (Q) | | | | |
| 1. Floodable | up to 10 | >10 ~ 20 | >20 ~ 34 | > 34 |
| 2. Non Floodable | up to 5 | > 5 ~ 10 | > 10 ~ 17 | > 17 |

(2) Credit Limit

| 2 - LIMITS | % | R\$ 1.00 | % | R\$ 1.00 | % | R\$ 1.00 | % | R\$ 1.00 |
|-----------------------------------|-----|-----------|-----|-----------|-----|----------|-----|-----------|
| a) Fixed/Mixed investment PROCERA | 100 | 1,000 (C) | 100 | 1,000 (C) | | | | |
| | | 7,500 (I) | | 7,500 (I) | | | | |
| PRORURAL | 100 | 12,000 | | | | | | |
| PRODEX | 100 | 1,000 (C) | 100 | 1,000 (C) | | | | |
| | | 7,500 (I) | | 7,500 (I) | | | | |
| Other Programs | 100 | 60,000 | 100 | 180,000 | 85 | 800,000 | 70 | 1,600,000 |
| b) Only Expenses (**) | 100 | 18,000 | 100 | 54,000 | 100 | 240,000 | 100 | 480,000 |

Obs.: (C)=Production Cost; (I)=Fixed Investment; PROCERA is for INCRA settlement; PRORURAL and PRODEX are special investment for mini and small farmers; the others are normal credit for farmers.

(3) Interest Rate

| Financial Charges | | Rate | Reduction | Rate | Reduction | Rate | Reduction | Rate | Reduction |
|--------------------------------------|--|------|-----------|------|-----------|------|-----------|------|-----------|
| PROCERA | | 12% | 50%* | 12% | 50%* | | | | |
| PRORURAL | | 3% | 75% | | | | | | |
| PRODEX | | 3% | 75% | 3% | 75% | | | | |
| PROSUMAM | | 4.5% | 60% | 4.8% | 50% | 5.1% | 40% | 5.4% | 10% |
| P R O D E P E C | Large Scale - Cattle Raisers | 4.5% | 50% | 4.8% | 50% | 5.1% | 15% | 5.4% | 10% |
| | Meat Production | | | | | | | | |
| | Small Scale - Cattle Raisers | 4.5% | 50% | 4.8% | 45% | 5.1% | 20% | 5.4% | 10% |
| | Milk Production | | | | | | | | |
| P R O D A G R I | Small / Medium Cattle raisers | 4.5% | 50% | 4.8% | 45% | 5.1% | 20% | 5.4% | 10% |
| | Lowland crops fruits cultivation, seeds, etc. | 4.5% | 50% | 4.8% | 50% | 5.1% | 40% | 5.4% | 10% |
| | Rice, Feijão beans and others Industrial Crops | 4.5% | 50% | 4.8% | 45% | 5.1% | 30% | 5.4% | 10% |

Obs.: PROCERA has 50% of discount in all rates and fixed rates; The others have TJLP (11.5% at present) and the discount is only for TJLP.

5 Livestock Industry

5.1 National Level

5.1.1 Overview

Beef cattle raising is a natural vocation of Brazil and has the world's largest commercial cattle herds. The balance of beef production sector for 1994, 1995 and estimates for 1996 are shown in Table VI.5.1. Recent international surveys have identified Brazil as one of the main countries where meat production is likely to grow strongly into 21st century. Moreover, a significant part of this growth supplies to the export market. Brazil is a beef exporter and importer, but a net exporter.

**Table VI.5.1: Balance of the Beef Cattle Sector for 1994 and 1995 -
Estimates for 1996**

| | 1994 | 1995 | 1996 |
|--|---------|---------|---------|
| Population (millions of inhabitants) | 153.7 | 155.8 | 157.9 |
| Cattle inventory (millions of heads) | 161.3 | 165.1 | 169.0 |
| Extraction rate for beef cattle (%) | 16.12 | 16.35 | 16.59 |
| Number of slaughter cattle (millions of heads) | 26.0 | 27.0 | 28.0 |
| Meat production (thousand m. tons of carcass equivalents) | 5,200.0 | 5,400.0 | 5,607.7 |
| Per capita consumption (kg of carcass equivalent) | 32.6 | 34.5 | 35.0 |
| Domestic consumption (thousand m. tons of carcass equivalents) | 5,017.5 | 5,376.4 | 5,527.7 |
| Exports (thousand m. tons of carcass equivalents) | 378.4 | 285.1 | 330.0 |
| Imports (thousand m. tons of carcass equivalents) | 195.9 | 261.5 | 250.0 |

Source: Secretaria da Recita Federal/ MF, EMBRAPA, IBGE, Elaborated by ; Forum National Permanent da Pecuária de Corte.

But the success of the Real Plan with ensuing strong Brazilian currency has also hit exporters, as has the Brazilian commitment within the Uruguay Round of WTO talks to reduce export subsidies for beef and poultry. Another problem facing the Brazilian meat industry is that the improved currency value has meant importing meat into Brazil has become much more attractive for neighbors, such as Argentina, Uruguay and Paraguay and thus put pressure on domestic producers. As mentioned above, Brazil's stronger real makes the country a more attractive market for surrounding countries and imports of beef have reacted accordingly, raising 40 percent from 1994 to 275,500 tons in 1995. Livestock production takes place throughout Brazil, but concentrates in a few southern states, as shown in below.

The livestock Products Geographical Distribution in Brazil

| | North | Northeast | West Central | Southeast | South |
|----------------|-------|-----------|--------------|-----------|-------|
| Poultry meat | 3 % | 12 % | 2 % | 33 % | 50 % |
| Eggs | 2 % | 15 % | 7 % | 55 % | 21 % |
| Pork | 2 % | 7 % | 4 % | 24 % | 63 % |
| Beef | 5 % | 7 % | 37 % | 28 % | 23 % |
| Milk | 2 % | 2 % | 10 % | 25 % | 61 % |
| Fish/Shellfish | 15 % | 55 % | 2 % | 12 % | 16 % |

Source: FLAIS (Feria Latino-Americana da Indústrias de Aves e Suínos), 1994.

The South and Southeast regions account for more than 75 percent of egg production, more than 80 percent of broiler meat production and nearly 90 percent of pork production. Much of the broiler meat and pork output from these regions is controlled by large independent producers and integrators. The change of the livestock population in National and Tocantins in Table VI.5.2 /VI.5.3, indicates a increasing of the livestock population over the past decades. The two species which has exhibited significant growth is swine and poultry, where numbers have grown by nearly 6 percent annually over the past years, mainly due to recent rapid expansion in the integrated industry. Main meat facts from Brazil is shown in Table VI.5.4.

Table VI-5.2 Livestock Population (National) – 1985 – 1993

| Year | Cattle | Buffalo | Swine | Goats | Sheep | Poultry |
|------|-------------|-----------|------------|------------|------------|-------------|
| 1985 | 128,422,666 | 882,142 | 32,247,681 | 10,020,101 | 18,658,967 | 470,087,999 |
| 1986 | 132,221,568 | 984,811 | 32,539,339 | 10,595,292 | 19,659,739 | 495,640,086 |
| 1987 | 135,726,280 | 1,082,126 | 32,479,681 | 10,791,965 | 19,859,609 | 514,550,021 |
| 1988 | 139,599,106 | 1,181,219 | 32,120,895 | 11,312,713 | 20,084,877 | 510,098,954 |
| 1989 | 144,154,103 | 1,285,043 | 33,015,038 | 11,669,018 | 20,041,463 | 531,219,358 |
| 1990 | No data | No data | No data | No data | No data | No data |
| 1991 | 162,135,505 | 1,432,112 | 34,290,275 | 12,172,146 | 20,127,945 | 594,392,594 |
| 1992 | 154,440,803 | 1,423,348 | 34,532,168 | 12,159,564 | 19,955,874 | 639,625,359 |
| 1993 | 155,134,073 | 1,498,890 | 34,184,187 | 10,618,531 | 18,008,283 | 654,167,008 |

Source : IBGE

Table VI – 5.3 Livestock Population (Tocantins) – 1989 – 1993

| Year | Cattle | Buffalo | Swine | Goats | Sheep | Poultry |
|------|-----------|---------|---------|---------|---------|-----------|
| 1989 | 4,189,500 | 16,845 | 500,520 | 40,860 | 42,390 | 2,834,790 |
| 1990 | No data | No data | No data | No data | No data | No data |
| 1991 | 4,440,540 | 19,770 | 553,360 | 44,830 | 43,560 | 3,597,266 |
| 1992 | 4,623,500 | 23,310 | 594,560 | 47,625 | 45,730 | 3,369,750 |
| 1993 | 5,138,904 | 25,854 | 650,118 | 50,393 | 47,531 | 3,856,024 |

Source : IBGE

Table VI-5.4: Main Meat Facts From Brazil

| Product | | 1994 | 1995 |
|--------------|-----------------------|---------|---------|
| Beef | Production | 5,200 | 5,400 |
| | Export | 378.4 | 289.5 |
| | Import | 195.9 | 275.2 |
| | Consumption | 5,017.5 | 5,385.6 |
| | Consumption (kg/head) | 32.6 | 34.6 |
| Pork | Production | 1,330 | 1,436 |
| | Export | 32 | 25 |
| | Import | - | - |
| | Consumption (kg/head) | 8.6 | 9.2 |
| Poultry meat | Production | 3,615 | 4,071 |
| | Export | 495 | 435 |
| | Import | - | - |
| | Consumption (kg/head) | 20.5 | 23.5 |

5.1.2 Cattle

The country with the world's largest commercial cattle herd continues to increase beef production and has a proud record of encouraging domestic consumption which has seen annual per capita sales rising from 32.6 kg in 1994 to an estimated 35 kg per capita in 1996. In beef cattle ranching prevails the so-called extensive system of production, which is based on pasture grazing.

Since the beginning of the last decade, the intensive systems of production based on feed lots has gained importance. Dairy cattle is raised all over the country. The prevailing soil and climatic conditions require an adjustment of the dairy cattle to the particular characteristics of each region and leads to the introduction of various systems of production.

5.1.3 Buffaloes

Buffalo was introduced into Brazil in 1895, at Marajo Island, in the State of Para. Brazil is one of the most important centers in Latin America for the production and use of buffaloes as a source of meat, milk and sub-products, draught, leather and manure. Thus, it can be assumed that buffalo farming is a reality in Latin America and future projections show that in the next century this species will be certainly one of the most important among the other animals raised on the continent. Buffalo production has expanded dramatically over the past decade in the country. They are raised mainly in areas with poor soil or periodic floodings where they are able to thrive conditions which even Zebu (Nelore) cattle cannot cope with.

Production systems vary depending on the purpose for which they are kept. Buffalo meat production is done under extensive conditions, while milk production is more intensively managed. One of the most important features of buffalo is beef production. Kept in conditions of good management and nutrition, buffaloes in the Amazon basin have had average daily weight gain of 1.5 kg. Buffalo meat has 40 percent less cholesterol, 12 percent less fat, 55 percent less calories, 11 percent more protein and 10 percent more minerals than the beef. In Brazil, milk average yield range between 1,100 to 1,200 kg with 8.5 to 10 percent of butter fat is common to be found among the milk herds on the Amazon basin. In São Paulo state, at the moment there is a boom in milk production that is used for the fabrication of cheese, mainly mozzarella and ricota type. In Brazil, CAPTU/EMBRAPA (Centro de Pesquisa Agroindustrial Amazonia Oriental) has conducted many experiments using buffaloes.

5.1.4 Swine

Over half of the total pork production in South America comes from Brazilian farms and production rate is rising fast. The same situation applies to poultry meat production, with Brazil's annual output now at over 4 million tons representing over 60 percent of the continent's production.

Brazilian output of pork has more than doubled in the last 12 years to 1.4 million tons in 1995. Whilst production has been increasing annually between 6% and 8%, domestic consumption has almost been keeping up. The 1995 figure was 9.2 kg per capita with an increase of 7 percent annually.

5.1.5 Poultry

There is a continuous expansion of poultry meat production in Brazil. It is now the fourth largest producer in the world and in South America, more than 75 percent of the poultry meat produced comes from Brazil. The country's overseas sales of poultry meat make it the world's third most important exporters. Domestic consumption has risen fairly constant at about 10 percent of production.

Within a period of 10 years until 1984, Brazil's poultry meat production rose from 1.4 million tons to 3.6 million tons and the 1995 figure was over 4 million tons indicating an annual increase of 12.6 percent. Domestic consumption, at 23.5 kg per capita in 1995, is way above the other countries in South America (Argentina 21.9 kg, Venezuela 17.5 kg), and exports in 1995 were 435,000 tons, representing a drop of 12 percent due mainly to the

strengthening real, after a long 5 percent rise during the decade 1984 - 94. The Middle East remains the country's most important market for broiler meat - which makes up about 75 percent of all Brazil's poultry meat shipments. Other main markets; the Far East and the EU.

5.2 Regional Level

5.2.1 Overview

The livestock production in Tocantins is carried out under a variety of adverse climatic and environment conditions. The animal husbandry centers around the large scale land owners of cattle ranches. The quality of statistical data on the livestock sub-sector is relatively poor, and does not provide a sound basis for planning. For example, the last livestock census was completed in 1985 and changes over the past decade could have been significant. Population data also varies significantly between the data collected at the census, and that collected annually by the IBGE local office. The data must thereafter be interpreted with considerable caution. Particularly, it should be mentioned that large errors may exist in the population estimates of buffaloes.

Livestock industry plays an increasingly important role in the sales tax collection amounting to about 13 to 15 percent of the total sales tax collection in the State.

Sales Tax (ICMS) Collection per Economic Activity (Current US Dollars)

| ICMS | 1993 (%) | 1994 (%) | 1995 (%) | 1996 (%) |
|---------------|----------------------|----------------------|----------------------|---------------------|
| Commerce | 21,156,510.52 (35.2) | 33,851,865.87 (38.3) | 43,413,789.96 (38.2) | 59,746,858.51(44.0) |
| Fuel | 12,899,526.98 (21.4) | 20,936,996.82 (23.7) | 23,792,842.66 (20.9) | 23,604,817.24(17.4) |
| Energy | 3,838,542.95 (6.3) | 5,720,592.98 (6.5) | 11,289,425.16 (9.9) | 11,609,947.40(8.5) |
| Livestock | 12,406,755.97 (20.6) | 15,067,652.88 (17.0) | 17,143,542.61(15.1) | 18,321,947.46(13.5) |
| Industry | 2,946,398.09 (4.9) | 2,979,377.40 (3.4) | 3,424,454.76(3.0) | 3,180,928.85(2.3) |
| Communication | 3,742,943.15 (6.2) | 6,235,222.51 (7.1) | 10,053,203.55(8.8) | 13,309,079.05(9.8) |
| Transport | 1,800,246.57 (3.0) | 2,797,534.74 (3.2) | 3,489,396.55(3.1) | 4,265,788.44(3.2) |
| Agriculture | 1,262,291.01 (2.1) | 812,689.31 (0.9) | 1,162,839.28(1.0) | 1,828,926.94(1.3) |
| Total | 60,053,215.24 | 88,401,932.51 | 113,769,494.76 | 135,867,639.89 |

Source: State Treasury - SEPLAN-TO.

However, livestock sector makes a major contribution to the rural economy by utilizing idle labor, marginal land, crop residues and other roughage as fodder for the livestock. Livestock are spread out throughout all regions of the State with the concentration of certain farming systems in particular areas because of market and/or agro-climatic reasons. On the basis of 1993 estimates prepared by the IBGE, Tocantins has over 3.3 percent of cattle and calves in Brazil (1993), 1.7 percent of Buffaloes, 1.9 percent of the hogs and 1.8 percent of the poultry (Table VI.5.5). The country, however, differ widely in geographical area and human population. The correlation of livestock to human population may be a better indication of the importance of species of livestock in a country.

Table VI.5.5.: Main Livestock Ranking in the Brazil - 1993

| Rank/State | CATTLE | | | | BUFFALO | | | | SWINE | | | | | |
|---------------|-------------|------------|------------|------|------------|-----------|------------|------------|-------|------------|------------|------------|------------|------|
| | Number | National % | Per Capita | Rank | Rank/State | Number | National % | Per Capita | Rank | Rank/State | Number | National % | Per Capita | Rank |
| 1 | 21,800,445 | 14.05 | 12.24 | 1 | 1 | 71,955 | 49.50 | 0.150 | 2 | 1 | 4,043,449 | 11.83 | 0.44 | |
| 2 | 21,034,400 | 13.56 | 1.34 | | 2 | 137,907 | 9.20 | 0.477 | 1 | 2 | 3,780,172 | 11.06 | 0.45 | |
| 3 | 18,580,908 | 11.98 | 4.62 | 4 | 3 | 87,807 | 5.86 | 0.010 | | 3 | 3,727,711 | 10.9 | 0.82 | 2 |
| 4 | 14,103,022 | 9.09 | 1.54 | | 4 | 81,826 | 5.46 | 0.010 | | 4 | 3,328,746 | 9.74 | 0.21 | |
| 5 | 12,690,148 | 8.18 | 0.4 | | 5 | 71,285 | 4.76 | 0.014 | | 5 | 2,755,138 | 8.08 | 0.56 | 5 |
| 6 | 11,681,559 | 7.53 | 5.76 | 2 | 6 | 64,169 | 4.28 | 0.002 | | 6 | 2,270,577 | 6.64 | 0.19 | |
| 7 | 10,022,150 | 6.46 | 0.84 | | 7 | 51,650 | 3.45 | 0.013 | | 7 | 2,083,096 | 6.09 | 0.42 | |
| 8 | 8,606,629 | 5.55 | 1.01 | | 8 | 41,101 | 2.74 | 0.023 | 4 | 8 | 2,014,936 | 5.89 | 0.06 | |
| 9 | 7,434,835 | 4.79 | 1.5 | | 9 | 38,030 | 2.54 | 0.002 | | 9 | 1,904,893 | 5.57 | 0.47 | |
| 10 | 5,138,904 | 3.31 | 5.59 | 3 | 10 | 32,487 | 2.17 | 0.016 | | 10 | 1,574,647 | 4.61 | 0.61 | 4 |
| 11 | 4,019,776 | 2.59 | 0.82 | | 11 | 32,066 | 2.14 | 0.015 | | 11 | 1,194,727 | 3.49 | 0.19 | |
| 12 | 3,286,112 | 2.12 | 2.9 | 5 | 12 | 29,293 | 1.95 | 0.006 | | 12 | 1,165,981 | 3.41 | 1.03 | 1 |
| 13 | 3,017,369 | 1.95 | 0.66 | | 13 | 25,854 | 1.72 | 0.028 | 3 | 13 | 893,333 | 2.61 | 0.44 | |
| 14 | 2,997,531 | 1.35 | 0.33 | | 14 | 22,102 | 1.47 | 0.020 | 5 | 14 | 650,118 | 1.9 | 0.71 | 3 |
| 15 | 1,982,460 | 1.28 | 0.77 | | 15 | 19,116 | 1.28 | 0.002 | | 15 | 591,630 | 1.73 | 0.53 | |
| 16 | 1,967,208 | 1.27 | 0.15 | | 16 | 7,169 | 0.48 | 0.001 | | 16 | 440,039 | 1.29 | 0.17 | |
| 17 | 1,934,282 | 1.25 | 0.74 | | 17 | 4,947 | 0.33 | 0.002 | | 17 | 409,338 | 1.2 | 0.06 | |
| 18 | 1,271,114 | 0.82 | 0.18 | | 18 | 4,047 | 0.27 | 0.006 | | 18 | 291,604 | 0.85 | 0.02 | |
| 19 | 907,799 | 0.59 | 0.61 | | 19 | 2,824 | 0.18 | 0.006 | | 19 | 230,787 | 0.68 | 0.07 | |
| 20 | 858,853 | 0.55 | 0.27 | | 20 | 1,771 | 0.12 | 0.001 | | 20 | 221,385 | 0.65 | 0.11 | |
| 21 | 801,582 | 0.52 | 0.32 | | 21 | 793 | 0.05 | 0.000 | | 21 | 193,309 | 0.57 | 0.46 | |
| 22 | 688,592 | 0.44 | 0.33 | | 22 | 301 | 0.02 | 0.000 | | 22 | 132,697 | 0.39 | 0.05 | |
| 23 | 565,975 | 0.36 | 0.23 | | 23 | 260 | 0.02 | 0.000 | | 23 | 119,679 | 0.35 | 0.05 | |
| 24 | 445,243 | 0.29 | 1.07 | | 24 | 165 | 0.01 | 0.000 | | 24 | 99,658 | 0.29 | 0.07 | |
| 25 | 123,569 | 0.08 | 0.08 | | 25 | 165 | 0.01 | 0.000 | | 25 | 48,535 | 0.14 | 0.03 | |
| 26 | 73,108 | 0.05 | 0.25 | | 26 | RR * | * | * | | 26 | 20,002 | 0.06 | 0.07 | |
| 27 | RR * | * | * | | 27 | RR * | * | * | | 27 | RR * | * | * | |
| Total/Average | 155,134,073 | | 1.06 | | | 1,493,890 | | 0.010 | | | 34,184,187 | | 0.25 | |

Source: IBGE, 1996. * data not available.

The per capita livestock population of main species in various states in 1993 is shown in Table VI.5.5. It is clear from it that per capita cattle, buffalo and swine population was the ranked 3rd respectively. These figures indicate that as regards per capita the Tocantins is the one of the most important state for the livestock production particularly compared with neighboring states. (Figure VI.5.1/VI.5.2.)

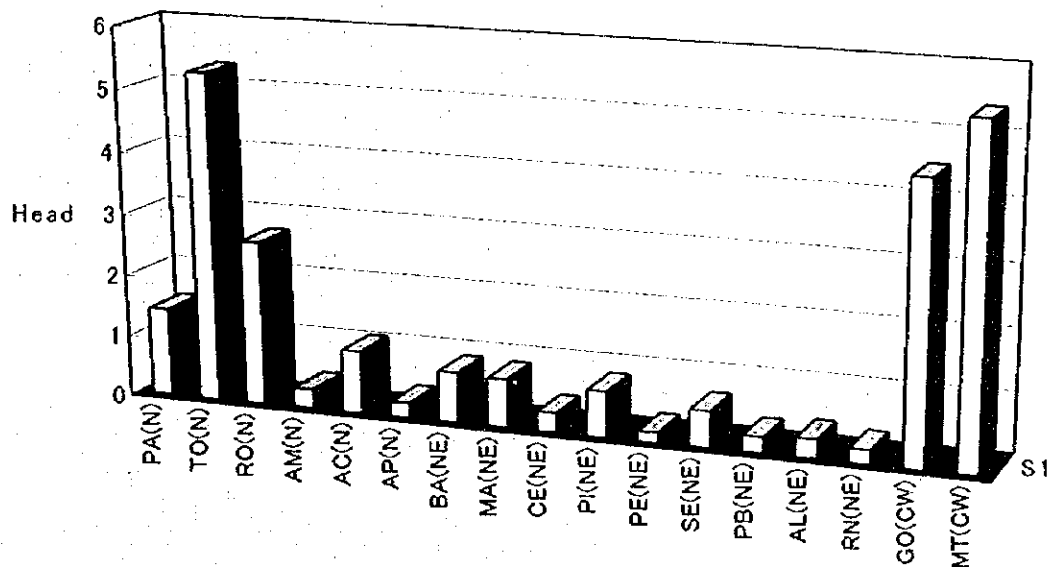


Figure VI-5.1: Per Capita Cattle Numbers in the Neighboring States

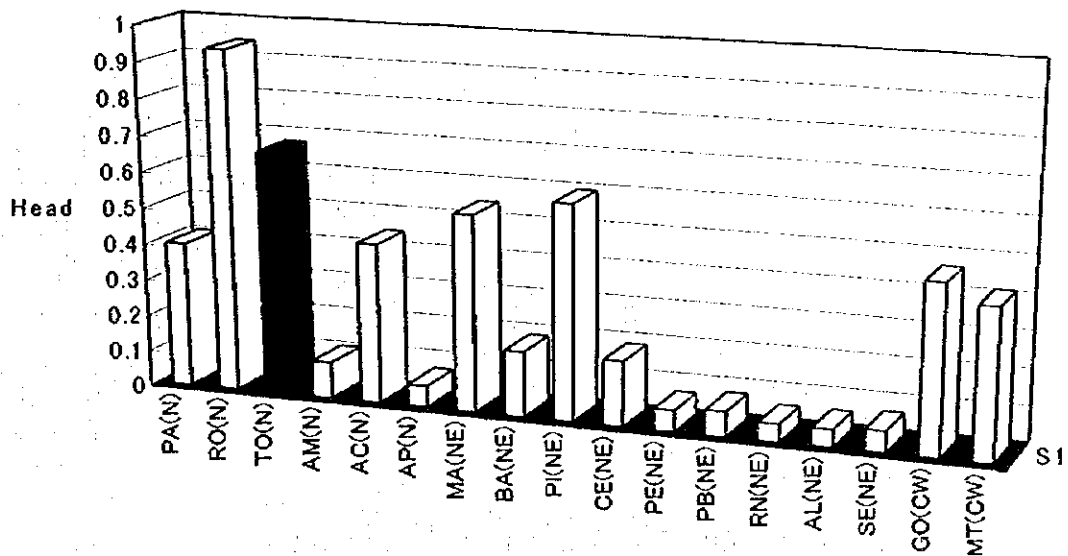


Figure VI-5.2: Per Capita Swine Numbers in the Neighboring States

Only 0.6 percent of Brazil's population live in Tocantins and hence the state has a surplus of most of the livestock products. Tocantins is dependent on external trade to dispose of surplus production. Without access to outside markets, Tocantins red meat producers would receive significantly lower prices for their products and probably would have to cut back production to the level of local consumption.

The livestock species important for red meat production are cattle, buffaloes, hogs and poultry. The population of livestock estimates in the state are given in Table VI.5.3. It can be seen from this Table that the cattle population as of 1991 estimates was 4.4 million as compared to 5.3 million of 1995 estimates, showing an increase of 26 percent. The buffalo population in 1991 was only 19 thousand which has increased to 35 thousand in 1995, showing an increase of 78 percent. The increase of buffalo population is much higher than that of cattle but it is still the lowest and unsatisfactory as compared with the cattle numbers. The livestock sector has received limited support in the past. It has been general problems of the development of the State - especially livestock development - since its establishment. Productivity of all livestock under existing management conditions, particularly small scale farm is generally low, albeit precise figures are not available. Table VI-5.6. shows livestock distribution in the regions of the state.

Table VI.5.6: Livestock Distribution in the Tocantins -1996-

| Region | Cattle(%) | Buffalo(%) | Swine(%) | Horse(%) | Mule(%) | Goats(%) | Sheep(%) | Poultry(%) |
|----------------------|-------------------|----------------|-----------------|-----------------|----------------|----------------|----------------|-------------------|
| EXTREME NORTH | 438,930 (7.83) | 0 | 122,387 (17.36) | 20,355 (11.32) | 15,675 (20.50) | 360 (0.66) | 1,040 (2.68) | 612,031 (13.51) |
| Per capita Livestock | 2.8 | 0 | 0.78 | 0.13 | 0.1 | 0.002 | 0.007 | 3.91 |
| NORTH | 1,137,200 (20.29) | 13,070 (37.13) | 72,491 (10.28) | 14,025 (7.80) | 10,155 (13.28) | 8,875 (15.80) | 9,163 (18.13) | 544,725 (20.88) |
| Per capita Livestock | 6.6 | 0.08 | 0.42 | 0.08 | 0.06 | 0.05 | 0.05 | 5.43 |
| NORTHEAST | 187,200 (3.34) | 0 | 59,600 (8.45) | 11,420 (6.35) | 6,330 (8.28) | 2,044 (3.72) | 2,705 (5.35) | 244,800 (5.41) |
| Per capita Livestock | 3.93 | 0 | 1.25 | 0.24 | 0.13 | 0.04 | 0.06 | 5.14 |
| NORTHWEST | 800,600 (14.23) | 6,470 (18.38) | 81,450 (11.55) | 16,420 (9.13) | 7,580 (9.91) | 3,730 (6.79) | 3,760 (7.44) | 391,210 (8.64) |
| Per capita Livestock | 7.98 | 0.05 | 0.81 | 0.18 | 0.08 | 0.04 | 0.04 | 3.9 |
| EAST | 182,625 (3.26) | 0 | 40,340 (5.72) | 12,920 (7.18) | 2,815 (3.68) | 8,355 (15.22) | 4,815 (9.13) | 255,580 (5.61) |
| Per capita Livestock | 6.63 | 0 | 1.46 | 0.47 | 0.1 | 0.3 | 0.17 | 9.27 |
| CENTRAL-WEST | 545,430 (9.73) | 6,750 (19.18) | 65,570 (9.30) | 16,095 (8.95) | 6,740 (8.81) | 6,330 (11.53) | 4,620 (9.14) | 448,520 (9.86) |
| Per capita Livestock | 6.22 | 0.08 | 0.75 | 0.18 | 0.08 | 0.07 | 0.05 | 5.1 |
| CENTRAL | 520,040 (9.28) | 680 (1.93) | 74,135 (10.51) | 14,800 (8.23) | 4,905 (6.41) | 5,895 (10.74) | 10,305 (20.38) | 544,500 (12.02) |
| Per capita Livestock | 2.87 | 0.004 | 0.41 | 0.08 | 0.03 | 0.03 | 0.06 | 3.01 |
| SOUTHEAST | 574,185 (10.25) | 265 (0.75) | 98,174 (13.92) | 44,120 (24.53) | 9,535 (12.47) | 15,510 (24.60) | 7,820 (15.47) | 431,710 (9.53) |
| Per capita Livestock | 5.23 | 0.002 | 0.89 | 0.4 | 0.09 | 0.12 | 0.07 | 3.93 |
| SOUTHWEST | 646,890 (11.54) | 7,655 (21.65) | 40,730 (5.78) | 14,950 (8.33) | 8,300 (10.85) | 2,780 (5.05) | 3,230 (6.39) | 283,870 (6.27) |
| Per capita Livestock | 13.29 | 0.16 | 0.84 | 0.31 | 0.17 | 0.06 | 0.07 | 5.83 |
| SOUTH | 570,500 (10.18) | 270 (0.77) | 50,250 (7.13) | 14,725 (8.19) | 4,437 (5.80) | 3,230 (5.85) | 3,295 (6.52) | 373,700 (8.25) |
| Per capita Livestock | 4.97 | 0.002 | 0.44 | 0.13 | 0.04 | 0.03 | 0.03 | 3.26 |
| TOTAL | 5,603,655 (100.0) | 35,260 (100.0) | 705,114 (100.0) | 179,882 (100.0) | 76,473 (100.0) | 54,810 (100.0) | 50,554 (100.0) | 4,528,672 (100.0) |
| Per capita Livestock | 5.36 | 0.03 | 0.67 | 0.17 | 0.07 | 0.05 | 0.05 | 4.33 |

Source: IBGE, 1996.

5.2.2 Cattle

Cattle account for 3.3 percent of the national herds but per capita cattle number is 5.9 heads, ranked 3rd followed by Mato Grosso do Sul and Minas Gerais. Apart from their obvious value of animal products (particularly meat), cattle sector has an important socio-economic function. Since three-quarters of Brazil's population live in Southern Regions, there is a considerable movement of feeder and slaughter cattle and beef from Tocantins to the beef consuming areas of South and North East region.

About 90 per cent of the cattle are of *Zebu type (Nelore)*, one of the wide spread breed in Brazil. The remaining cattle of the herd are mainly *Gir, Guzera, Santa Gertrudes,*

Girolanda, *Brown Swiss* and their crosses. The areas where the cattle population are highly concentrated include North and North-West region, particularly Araguaina (North) and Arapoema (North-West) municipalities.

There are a number of large scale privately-owned cattle farms in most of the study area. Management, feeding and breeding practices on these large scale farms are usually superior to those on the small scale farmers not because that they are inherently more efficient but because of the superior knowledge and resources of the operators. These include cow-calf producers, breeding stock producers, fattening operations and dairy cattle producers. Cattle can be marketed at various ages; feeder calves, stockers, finished cattle and mature cows and bulls.

The majority of the large producers manage their stock in corral, either in shades or yards. Some of them breed their own replacements, indeed many of them are breeding units for their areas in which they are situated, but others purchase replacement heifers. Where replacements are purchased, the culling rate is usually high, sometimes as much as 30 to 40 per cent per annum.

5.2.3 Buffaloes

According to the extensive field survey results, conducted by the study team, there are river type buffaloes in the Tocantins State as well as in the nation. Domesticated river type buffaloes were introduced into Tocantins during some time of the first half of the 20th century by the large scale farms but due to lack of management, a large number of the buffaloes turned wild.

At present attempts are made in North and Northwest regions to re-domesticate the feral buffaloes and results so far achieved are encouraging. It may be stated that they maintain buffaloes not from ignorance of the potentialities of the large ruminant but because they find that in the prevailing agricultural situation no other domestic animals will thrive like the buffalo and be so useful and economical. The main breeds found on milk and meat buffalo farms are such as *Murrah*, *Mediterranean* and *Jafarabadi*. Small farms with 50 to 100 buffaloes raised especially for sale can now be found in various regions such as Araguaina, Rio Formoso and Miracema do Tocantins. Although buffalo raising is an economic activity present in most of the Brazil.

In Tocantins, buffalo population is increasing recently. It has been reported that buffaloes produce two or three times more milk than local cows, having more milk fat and total milk solid. In Tocantins, buffalo population has consistently grown faster than that of cattle and farmers are shifting from cows to buffaloes as a source of milk and meat. The main reason is that buffaloes are emerging as more economical animals since males are utilized for meat production, females are used for breeding and milk production. Buffaloes are also easily managed in many ways and in general are raised similarly to cattle. They can be managed extensively and fit every available resource of the farm, covering high fiber roughage to protein and due to its adaptability it can have a growth rate superior to that of cattle. In the study area, they can produce a calf per year, the female is productive for 25 years or more and the herd is increasing 12 percent yearly. In the study area, environment conditions, buffaloes seem to be very well adapted and have demonstrated an excellent reproductive performance with high economic profitability. Within of the new strategies for sustainable development of the

study area a new model for livestock production system is recommended including the use of buffaloes with food crops both for subsistence and sale. However, much more information, infrastructure and support are required for research program in large-scale operations to bring more improvement and expansion of production of this species. New strategies for sustainable development using buffaloes as a suitable animals must be focused on smallholders.

It has been shown that buffalo beef have equal quality as cattle beef, and beef from buffalo contain less fat, both marbling and outside fat, as compared to beef and chicken. Such promotion or consumer campaign could lead to fast growing of specialized buffalo raising for meat purpose in the future.

5.2.4 Small Ruminant

In the past there has been some disagreement as to the value of goats because of the widely held belief that the damage they do to trees and vegetation - especially in arid regions - outweighs their usefulness as producers of meat, milk and skin. However, intensive or semi-intensive dairy goats production have been developed in some large scale farms in the study area, particularly around fast growing urban areas.

By Controlled management, they can be of great help in agricultural development and food production. Special mention has been made for the European breeds in the study area; *Anglo-Nubian*, *Toggenburg* and *Saanen*. The *Saanen* appear to be more promising than the *Toggenburg*, but both are excelled by the *Anglo-Nubian* for tropical use. Some farms are producing an average of 2 - 3 kg of milk per day. In area of good managed farms, 4 - 5 kg of milk per day at peak lactation period has been obtained.

In some large scale farms, it has been shown that on improved grass pastures, the carrying capacity can be 40 to 50 goats per hectare. These farms use fresh milk in the making of cheese in the farm and directly distributes to the town's retail stores or to the urban consumers.

5.2.5 Swine

This sector is one of the least developed but per capita number is much higher than national average (see Table VI.5.5). Pig farming is undertaken in both intensive and extensive systems. In the extensive systems only 1 - 2 pigs are kept and the operation is predominantly of a subsistence nature, practiced mostly by small scale farmers. In the rural area, the most common breed is a indigenous breed such as *Tatu*, *Nilo* and *Canastro*. The most concentrated area is Extreme-North region. The performance of indigenous breeds are well adapted to heat stress, disease resistant and low energy diets. Hogs are mostly raised for communities consumption under a random breeding and scavenge systems with little attention for feeding and husbandry. The commercially oriented farmers keep the pig under the intensive systems and fattening and/or breeding is done more systematically and exclusively on home mixed feed and swill. Farmers who use intensive production systems generally keep about 10 - 15 breeders although some rise over 80 breeders. Some aggressive farms are already raising hybrid pigs originated in the Europe but the feeding system is rather behind the most developed countries.

5.2.6 Poultry

Traditional extensive chicken raising is common in the village of Tocantins. Each families keep minimum 4 - 5 laying hens for egg production and they produce their own breeding stock locally. However, traditional poultry production is based on a scavenger system with chickens, ducks foraging for feed near households and in the fields, although confined feeding systems with new economic crosses and some hybrids are beginning to appear near large towns and cities.

All of the native chickens are adapted to tropical conditions, and are generally more resistant to diseases and high temperatures than the exotic breeders being raised commercially. Most of these traditional poultry can perform much better than exotic breeds when feeding and management are not of a high standard, as when birds are free-range and scavenge for feed. Furthermore, the meat and eggs are generally regarded as having better flavor than those of modern exotic breeds of layers and broilers.

5.3 Animal Health Status

The veterinary service is a state owned network in Tocantins, with a pyramidal organizational systems. The National Veterinary Diagnostic Center and the Veterinary Research Institute are located in Brasilia and Belem. The state network complete with the animal quarantine and animal sanitary inspection with other regional veterinary sub-station. Some of the municipalities has a local veterinary service and small stations are available but in short supply and generally very low equipment. The compulsory vaccinations which covers some 75 percent of the cattle are carried out by the government contracted veterinarians but the major part of the cost have to be born by farmers. In disease control and prevention high priority is given to Foot and Mouth Disease (FMD), mainly in the large scale farms. The most dangerous diseases are anthrax, FMD, bovine pasteurellosis, Haemorrhagic Septicaemia, blackleg, rabies, brusellosis, equine infectious anemia and the swine fever. Table VI.5.7 shows recent outbreaks of main livestock diseases in Tocantins. As in many developing countries, the knowledge and methods of diagnosis and treatment of such diseases among local communities are still limited despite development in the structure and efficiency of animal health control programs. The loss in stock numbers, productivity and potential export markets are the result of ineffective disease control and hygiene conditions and significantly effect the State livestock economy.

Table VI.5.7: Main Animal Diseases Outbreaks in Tocantins. -1990-1996

| Diseases | No. of | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 |
|-------------|------------------|-------|------|-------|-------|--------|-------|------|
| FMD | Outbreaks | 45 | 7 | 19 | 38 | 103 | 61 | 22 |
| | Infected Animals | 1,355 | 78 | 1,635 | 2,635 | 12,438 | 3,167 | 461 |
| | Death Animals | 6 | 7 | 9 | 85 | 188 | 137 | 35 |
| Brucellosis | Outbreaks | 7 | 5 | 18 | 53 | 81 | 69 | 42 |
| | Infected Animals | 127 | 21 | 127 | 512 | 440 | 757 | 766 |
| | Death Animals | **** | **** | **** | **** | **** | **** | **** |
| Rabies | Outbreaks | 8 | 5 | 9 | 1 | 12 | 31 | 4 |
| | Infected Animals | 49 | 15 | 44 | 2 | 31 | 548 | 47 |
| | Death Animals | 49 | 15 | 44 | 2 | 31 | 548 | 36 |
| Blackleg | Outbreaks | 1 | 6 | 6 | 37 | 20 | 8 | 3 |
| | Infected Animals | 6 | 28 | 17 | 112 | 48 | 26 | 383 |
| | Death Animals | 6 | 23 | 17 | 18 | 45 | 24 | 4 |
| Equine | Outbreaks | 113 | 141 | 144 | 264 | 134 | 66 | 103 |
| | Infected Animals | 412 | 495 | 450 | 800 | 370 | 127 | 97 |
| Anemia | Death Animals | **** | **** | **** | **** | **** | **** | **** |

Source: SAG, 1997.

FMD control and eventual eradication requires an efficient and veterinary network and Tocantins will need significant additional resources for this purpose. The strengthening of veterinary services necessary for FMD control will evidently also improve all livestock production efficiently and will be considered as a priority activity. Cold chain facilities and equipment presently inadequate to service more isolated village, will be gradually increased or improved for the purpose of more wide extensive vaccination for all importance diseases.

The eradication of FMD in Argentina, Uruguay and in several provinces of southern Brazil (Rio Grande do Sul and Santa Catarina) has created the expectation that this region of the world will return to its former role of a major player in the international meat markets.

5.4 Livestock Markets

The marketing of livestock in Tocantins ranges from a free market systems. Tocantins beef comes from a number of different operations. These include cow-calf producers, breeding stock producers, and dairy cattle producers. Cattle can be marketed at various ages: as feeder calves, stockers, finished cattle and mature cows and bulls. Feeder or stocker calves are sold through private auction market (Leialao) direct to producers or through middlemen which are located in main cattle production areas. Slaughter cattle can be sold to the packer, directly or through the middlemen. The major beef packing plants in Tocantins are FRIGOTINS (400 heads/day), FRIMAR (600 heads/day), FRICOL (300 heads/day) and SAFRIGU (400 heads/day) which used to slaughter about 30 percent of cattle killed in the state. Beef and finished beef cattle are mostly transported to the North-East region of the country.

Beef cattle farmers usually willing to sell all surplus male cattle when they consider that they are overstocked but they do not normally breed cattle specifically for meat production. It is therefore not surprising that the major production of the beef produced in the study area is not of a very high quality, that the marketing of it is often inefficient and somewhat unorganized and that the introduction of improved production and marketing techniques and the overall development of the industry are slow and laborious.

Pigs and poultry are slaughtered at private retail shops and consumed local demand only but there are no slaughterhouses and no meat inspections.

Most milk is collected by the local cooperatives or middlemen; some producers transport milk directly to the local processing plants or processing plant employees go to the farms to collect it. Many kind of milk products, such as pasteurized fresh milk, yogurt, butter and cheese are processed near the urban centers and sold to the consumers.

Prices of main livestock products in the State is shown in Table VI.5.8.

Table VI.5.8: Livestock Products Prices in Tocantins (Araguaína) -1997 (Jan. - Oct.) Unit: Real

| Products | Unit | Jan. '97 | Feb. '97 | Mar. '97 | Apr. '97 | May '97 | Jun. '97 | Jul. '97 | Aug. '97 | Sep. '97 | Oct. '97 |
|--------------------------|--------|----------|----------|----------|----------|---------|----------|----------|----------|----------|----------|
| Beef cattle, Male | Arroba | Max. | 23.00 | 22.00 | 23.00 | 23.00 | 22.00 | 21.00 | 21.00 | 23.00 | 24.00 |
| | | Min. | 21.00 | **** | 22.00 | 22.00 | 21.00 | 20.00 | 20.00 | 20.00 | 23.00 |
| Beef cattle, Female | Arroba | Max. | 19.00 | 19.00 | 18.00 | 18.00 | 18.00 | 17.00 | 17.00 | 18.00 | 19.00 |
| | | Min. | 18.00 | 18.00 | 17.00 | 17.00 | 17.00 | 16.00 | 16.00 | 17.00 | 18.00 |
| Steers, 2 years old | Head | Max. | 250.00 | **** | 270.00 | 230.00 | 220.00 | 200.00 | 200.00 | 220.00 | 230.00 |
| | | Min. | 240.00 | **** | 250.00 | 220.00 | 200.00 | 180.00 | 160.00 | 210.00 | 215.00 |
| Female, for breeding | Head | Max. | 240.00 | 230.00 | 245.00 | 240.00 | 220.00 | 230.00 | 230.00 | 210.00 | 220.00 |
| | | Min. | 210.00 | 230.00 | 230.00 | 230.00 | 200.00 | 200.00 | 180.00 | 200.00 | 210.00 |
| Female, for fattening | Head | Max. | 180.00 | 200.00 | 200.00 | 170.00 | 180.00 | 170.00 | 170.00 | 170.00 | 170.00 |
| | | Min. | 160.00 | 180.00 | 170.00 | 160.00 | 170.00 | 160.00 | 150.00 | 150.00 | 160.00 |
| Heifers, 1 to 2 years | Head | Max. | 150.00 | 180.00 | 160.00 | 140.00 | 140.00 | 145.00 | 145.00 | 140.00 | 140.00 |
| | | Min. | 120.00 | 140.00 | 140.00 | 130.00 | 120.00 | 130.00 | 120.00 | 130.00 | 130.00 |
| Young Bull, 1 to 2 years | Head | Max. | 180.00 | 200.00 | 200.00 | 200.00 | 170.00 | 200.00 | 200.00 | 200.00 | 200.00 |
| | | Min. | 160.00 | 180.00 | 180.00 | 180.00 | 150.00 | 170.00 | 170.00 | 170.00 | 180.00 |
| Hogs, lard type | Arroba | Max. | 18.00 | 18.00 | 18.00 | 17.00 | 17.00 | 17.00 | 17.00 | 18.00 | 18.00 |
| | | Min. | 17.00 | 17.00 | 17.00 | 16.00 | 16.00 | 16.00 | 16.00 | 16.00 | 16.00 |
| Hogs, bacon type | Arroba | Max. | **** | **** | **** | 20.00 | 19.00 | **** | **** | **** | **** |
| | | Min. | **** | **** | **** | 19.00 | 18.00 | **** | **** | **** | **** |
| Broiler | kg | Max. | 1.80 | 1.75 | 1.75 | **** | 1.30 | **** | **** | **** | **** |
| | | Min. | 1.40 | 1.60 | 1.50 | **** | **** | **** | **** | **** | **** |
| Local chicken for meat | Unit | Max. | 7.00 | 5.00 | 5.00 | 5.00 | 4.00 | 3.50 | 3.50 | 4.00 | **** |
| | | Min. | 5.00 | **** | **** | **** | **** | **** | 0.00 | **** | **** |
| Eggs, white, extra large | Dozen | Max. | 0.85 | **** | **** | **** | 0.93 | 0.93 | 0.93 | 0.98 | **** |
| | | Min. | 0.93 | **** | **** | **** | **** | **** | **** | 0.90 | **** |
| Eggs, brown, extra large | Dozen | Max. | 1.00 | **** | **** | **** | 0.93 | 0.93 | 0.93 | **** | 1.00 |
| | | Min. | 0.90 | **** | **** | **** | **** | **** | **** | 0.90 | **** |
| Eggs, local chicken | Dozen | Max. | 1.30 | 1.30 | 1.30 | 1.50 | 2.00 | **** | 1.50 | 2.00 | 2.00 |
| | | Min. | 1.00 | 1.00 | 1.00 | 1.40 | 1.50 | **** | **** | 1.50 | 1.50 |
| Cheese, Minas type | kg | Max. | 3.50 | 3.50 | 3.50 | **** | **** | **** | **** | **** | **** |
| | | Min. | 3.00 | 3.00 | 3.00 | **** | **** | **** | **** | **** | **** |
| Butter | kg | Max. | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| | | Min. | **** | **** | **** | **** | **** | **** | **** | **** | **** |
| Fresh milk | Liter | Max. | **** | 0.18 | 0.18 | 0.18 | 0.24 | 0.24 | 0.24 | 0.25 | 0.25 |
| | | Min. | 0.18 | 0.18 | **** | **** | **** | **** | **** | 0.20 | 0.20 |
| Fresh water fish | kg | Max. | **** | **** | **** | **** | **** | 2.00 | 2.00 | 2.50 | **** |
| | | Min. | **** | **** | **** | **** | **** | **** | **** | 2.00 | 2.00 |

Source: SAG, Cotacao Mercado Agricola
**** no data

5.5 Inland Fisheries

Fish is not a staple food in the Brazilian diet, making fish growing one of the new ventures to get into. At present, abundance of fresh fish in a locality can be facilitated through the construction of backyard or fish ponds. This scheme requires low level of investment but profit are unknown for the future. It is required more deep survey of this field including marketing.

The average per capita consumption of fish in the country is 4.7 kg/year. The Tocantins State has 100ha of lakes, with a capacity of 250 ton/year. Considering the state population in 1996, 1,046,823, i.e., around 1 million inhabitants, the resulting consumption is 0.250 kg/per capita/year, excluding the fish providing from natural hydric manantials and importation. According to the Aquaculture Division (SAG), the average yield is around 6t/ha/year, for native species, in semi-intensive systems, a higher yield when compared to other states. The implantation cost was estimated in around R\$ 18,000/ha/year, with a gross income of R\$ 12,000/ha/year, considering the price of R\$ 2.00/kg (wholesale minimum price).