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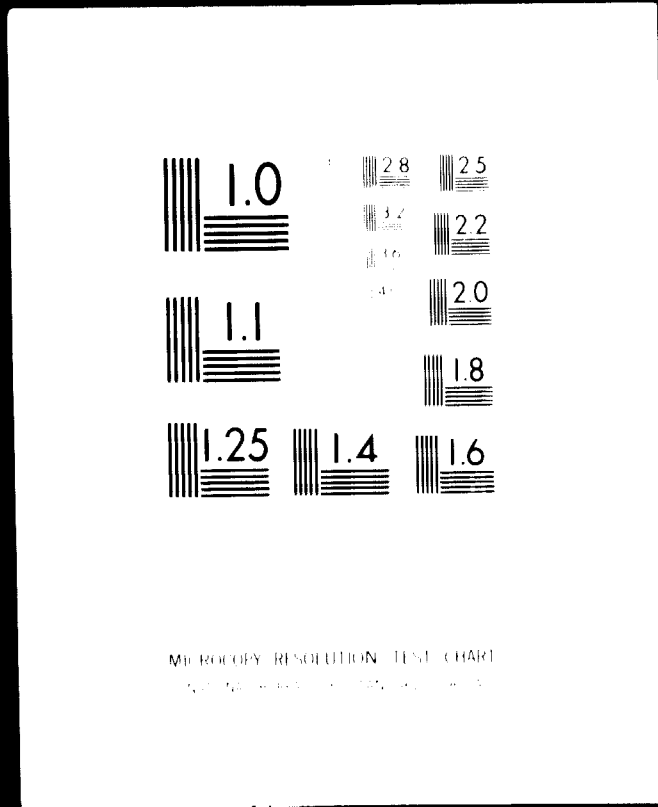
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02444

COUNTRY STUDY REPORT

on the

STATUS OF AGRICULTURAL MACHINERY INDUSTRY

in

N E P A L

Information compiled  
during  
a fact finding survey.

UNIDO, Vienna  
January 1969

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\* Note: The opinions expressed in this document do not necessarily reflect the views of the Secretariat of ECAFE or that of UNIDO.

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SUMMARY OF COUNTRY STUDY - NEPAL

I. Agricultural Pattern

Out of 14 millions of ha of geographical area Nepal has only 1.8 millions of ha of cultivated land of which 1.1 are wet areas and 0.7 dry areas.

With a total population of 10.3 millions population pressure upon cultivated land is around 6 persons per ha and 92% of the population is engaged in agriculture.

Main crops are paddy upon 54% of the total area and maize 22% but wheats, oil seeds and milled are also significant. Usage of hybrid seeds fertilizers and pesticides are limited. Irrigation facilities are being expanded.

II. Farm Mechanization Pattern

Most of the cultivating, harvesting and threshing operating are done by hand and with traditional tools drawn by bullocks.

About 600 tractors and 15 power tillers are in use. A limited number of other modern farm implements are imported. Future marked for tractors (1975) is estimated to 500 and 300 also for power tillers.

Both semi governmental and private organizations are involved in distribution. There is an urgent necessity to introduce a large quantity of more modern farm machinery improved bullock implements, paddy and wheat threshers, sprayers, and also irrigation pumps and engines.

/III.

III. Manufacturing of Farm Machinery, other Industries and Ancillary Facilities.

Two factories are interested in manufacturing farm implements: a very small one operated by "Agricultural Engineering Development and Research Station" and a new one set up at Birganj with help of U.S.S. The one has good modern equipment is able to produce bullock drawn implements and hand tools at the rate of 1,000 tons per year. It needs to be helped for starting a real serial productions and for marketing his products.

There are almost no other industries facilities.

IV. Conclusions

Nepal constitutes a very small market for power farm machinery which has to be imported from India and other countries. Help from international agencies and countries like India and Ceylon is to provide for starting producing and marketing of a line of simple implements to be produced in the factory of Birganj.

SECTION I

SECTION I

GENERAL PATTERN OF AGRICULTURE

1. Geography and Populations

The Kingdom of Nepal lies on the southern slope of the more than 2100 kms long Himalaya Mountain Range, the highest chain of mountains in the world, which separates tropical India from the Asiatic plateau. It has an area of about 14,000 millions ha located between longitude  $83^{\circ}$  to  $88^{\circ}$ E and latitude  $27^{\circ}$  to  $30^{\circ}$ N. The length and width are approximately 890 kms and 160 kms respectively.

Agricultural areas are only:

- (a) The "Terai Plains" a strip of alluvial almost level and fertile terrain along the Indian border.
- (b) The midland region (Mahabharat Hills) between the Himalya range in the North and Churia hills, where cultivation is practiced in valleys and even on steep slopes of the mountains by an intricate system of terraces.

Nepal falls within the Southeast Asia monsoon region. The altitude of the country varies from about 60 m above sea level to the highest in the world. These tremendous differences in altitude, together with the division of the year into a dry season and rainy season have resulted in the small country having almost all the climate zones of the earth varying from tropical jungle in the Ganges plain (Terai) to arctic desert waste in the higher regions, and the arid zone of the Tibetan plateau in the northern-most part.

Total population was 10,294 millions in 1968, and it is referred for 1965 - 92% of agricultural population and also 92% of persons engaged in agriculture for a number of 4,555 millions.



2. Land Utilization

(a) Land distribution by nature

About 13 percent of the total land area of the country is devoted to agriculture and much of this is limited in potential by its steep topography. This creates a need for promoting heavy production on the limited area that is suitable for intensive farming. Details of land use is given in table 1.1

Table 1.1 - Land Use Data

| <u>Land use type</u> | <u>Area</u><br>(Million ha) | <u>Percent of Total</u> |
|----------------------|-----------------------------|-------------------------|
| I. Agricultural      | 1.8                         | 12.93                   |
| Hilly region         | 0.61                        | 4.24                    |
| Terai region         | 1.21                        | 8.67                    |
| II. Forest land      | 4.5                         | 32.02                   |
| III. Other land      | <u>7.8</u>                  | <u>55.05</u>            |
| Total of all land    | <u>14.1</u>                 | <u>100.00</u>           |

Out of the total of 1.82 million ha of arable area of the country, 1.09 million ha are considered wet areas and 0.73 million ha are dry areas. Wet areas get plentiful water and are suitable for crops like rice and sugarcane. Dry areas depend purely on rainfall and are suitable for crops which do not require large quantities of water. In general, 95 per cent of the wet area is invariably planted in the basic food crop of the country - rice. A very small percentage of the dry area is also utilized for growing rice of the earlier lower-water-requiring varieties. About 65 per cent of the dry area is usually cultivated in maize.

(b)

(b) Land distribution by crops and agricultural production

Table 1.2 - Total Area under Different Crops  
(000 hectares)

| <u>Crops</u>         | <u>Area</u>         | <u>Percent of Total</u> |
|----------------------|---------------------|-------------------------|
| I. Cereal crops      | 1,772               | 87.57%                  |
| Paddy                | 1,110               | 54.20%                  |
| Maize                | 450                 | 22.18%                  |
| Wheat                | 112                 | 6.16%                   |
| Millet               | 100                 | 5.03%                   |
| II. Pulses           | 63                  | 3.13%                   |
| III. Vegetable crops | 41                  | 2.05%                   |
| Potato               |                     |                         |
| IV. Industrial crops | 147                 | 7.25%                   |
| Oil seeds            | 97.5                | 4.80%                   |
| Jute                 | 32                  | 1.58%                   |
| Sugarcane            | 9.3                 | 0.47%                   |
| Tobacco              | 7.4                 | 0.37%                   |
| Other                | 0.7                 | 0.30%                   |
| Total of all crops   | 2,020 <sup>1/</sup> |                         |

Yield per acre of rice, wheat and legumes in Terai plains

| <u>Area</u>                               | <u>Crop</u> | <u>Yield per acre</u> |
|---|-------------|-----------------------|
| Max yield<br>in selected area             | Paddy       | 2.2 T/h.a.            |
|   | Wheat       | 1.25T/h.a.            |
| Govt. farms and average<br>farms (mediwa) | Paddy       | 1.5 t/ha.             |
|   | Wheat       | 0.85T/h.a.            |
| Most of average farms<br>(poor)           | Paddy       | 1 T/h.a.              |
|   | Wheat       | 0.5 T/h.a.            |
|   | Legumes     | 0.25T/h.a.            |

(c) Land distribution by size and nature of holding

For a total number of 1,495,500 holdings the average size is about 1.2 ha. - and is only 0.5 ha. in hills.

<sup>1/</sup> The distribution of this area exceeds the total area (1,825,000) due to double cropping in some areas.

The distribution by size is known only for Jhapa District of Terai and is given by the following table:

Table 1.3 - Percentage distribution by size of holding (in Jhapa District of Terai, Eastern Nepal)

| <u>Land in Hecters</u> | <u>Percentage</u>       |
|------------------------|-------------------------|
| Less than 1            | 4.92%                   |
| 1 - 2.5                | 49.80%                  |
| 2.5 - 5.1              | 26.66%                  |
| 5.1 - 10.20            | 14.23                   |
| 10.20 - 20.40          | 4.08                    |
| 20.40 - 51.00          | 0.50                    |
| 51.00 -102.00          | 0.05                    |
|                        | <u>100.00 (approx.)</u> |

73% of farmers are owners and 27% tenant farmers.

(d) Land reforms:

The present land reform programme was started 4 years back with 3 phases. The first phase covered 16 districts, 2nd phase 25 and 3rd phase 34 districts. The following are the highlights of land reform acts:

(i) Land Ceiling: The following are the ceiling on land holdings:

| <u>Area</u> | <u>Type</u>       | <u>Land Ceiling</u> |
|-------------|-------------------|---------------------|
| Hills       | Owner cultivated  | 4 h.a.              |
|             | Tenant cultivated | 1 h.a.              |
| Valley      | Owner cultivated  | 2½ h.a.             |
|             | Tenant cultivated | 1 h.a.              |
| Plains      | Owner cultivated  | 16 h.a.             |
|             | Tenant cultivated | 3 h.a.              |

/(ii)

- (ii) Permanent tenancy rights have been conferred on tenant cultivator.
- (iii) Ceiling on rent except in valley is 50% of main crop only and in valley 37½% only of main crop in case of tenant cultivation.
- (iv) Compulsory savings scheme has been introduced with following objectives:
  - (a) Institutionization of private agricultural credit.
  - (b) Collection of compulsory savings which is a loan to H.K. Government at 5% interest to be paid back after 5 years.

This is to be 2% of the gross produce - (to be divided in the ratio 2:1 between landlord and farmer in case of tenant farmer) to be paid in cash or kind. The village ward committees which are 34,000 in number is to collect these savings and keep it in trust. So far Rs. 120 million has been collected. The target is to collect Rs. 500 million to act as revolving fund.

### 3. Cattle Population

Number of draft animals

|           |           |
|-----------|-----------|
| Bullocks  | 2,850,000 |
| Buffaloes | 4,75,000  |

### 4. Farming Practices and Agricultural Development

(a) Farming practice is different according to the regions. The Terai is the most intensively cultivated sector of Nepal and rice is cultivated on ~~xxx~~ over 80 per cent of the arable land. The main rice crop season is during the monsoon period ~~xxxxxx~~ from June to October. It is followed by a second crop predominantly wheats,

/during

during the winter period but about 30% of farmers grow 2 crops of paddy. Other crops are maize in the higher lands, sugar cane in a very limited area where plenty of water is assured, jute upon 10 percent of the eastern district.

(b) Midlands and Hills : Rice is cultivated up to an elevation of 1,800 m upon terraces from May to October and is followed by a winter wheat crop. Maize is also grown upon a significant area. In altitudes higher than 3000 m and below 6,500 m wheat grown in October and harvested in September is the most popular crop.

Paddy is transplanted for 80% and broadcast for the rest.

(c) Use of hybrid seeds and fertilizers : Only about 2 - 5% of cultivated area is under H.S and about 10% is under Mexican wheat. Normally fertilizer is not yet used by most of the farmers.

(d) Farm Harvest Price 1968 :

|         |             |
|---------|-------------|
| Paddy   | Rs. 750/ton |
| Wheat   | Rs.1250/ton |
| Legumes | Rs.1750/ton |

/SECTION II

SECTION II

PATTERN OF FARM MECHANIZATION

1. Farm Machinery Population

There have not been survey on farm machinery so far. Surveys on farm machinery are due to be undertaken by census department on the agricultural census programme.

However, in 1960, it was estimated that the population of agricultural tractor to be 210 and garden type tractors 11 numbers. The present population is estimated as follows:

|                         |     |
|-------------------------|-----|
| Tractors (Agricultural) | 700 |
| Power tillers           | 15  |

Following is the estimated distribution pattern in 1969.

(a) Tractors

|                                |            |
|--------------------------------|------------|
| Old Massey Ferguson            | 300        |
| New Massey Ferguson from India | 100        |
| International Harvester        | 10         |
| New I.H. from India            | 30         |
| Escorts from India             | 3          |
| Tractors from USSR             | 200        |
| Cliver, Lanz, Marshall etc.    | <u>60</u>  |
| Total                          | <u>700</u> |

Out of 700 tractor population, it is estimated that about 100-150 are out of commission.

(b) Power tillers

/Iskd

|                       |           |
|-----------------------|-----------|
| Isaki                 | 8         |
| Yanmar                | 1         |
| Honda                 | 4         |
| Krishi (India)        | 1         |
| Fuken (Rep. of China) | <u>1</u>  |
| Total                 | <u>15</u> |

Apart from tractors and power tillers, most of the small machinery is mostly imported from India. Tractors and other equipment is imported from other countries also. No custom duty is levied on agricultural tractors and implements imported. No subsidy is given regarding the purchase of farm machinery.

2. Import of Tractors and Farm Machinery

As of 1967, the following type of implements are imported:

| <u>Items</u>                     | <u>Specification</u>            | <u>Approx. Units</u> |
|----------------------------------|---------------------------------|----------------------|
| 1. Tractors                      | 25-35 hp                        | 600                  |
| 2. Irrigation pump               | 8-10 hp with engine centrifugal | 150                  |
| 3. Power tillers                 | -                               | 15                   |
| 4. Hand pumps                    | For water supply                | 50,000               |
| 5. K.B. plow                     | Bullock drawn                   | 15,000               |
| 6. Plant protection              | Equipment                       | 500                  |
| 7. Rice huller w/engine or motor |                                 | 1,000                |
| 8. Pedal thresher                |                                 | 200                  |
| 9. Power thresher                |                                 | 10                   |
| 10. Hand implements              |                                 | 100,000              |

3. Sales of Farm Machinery

(1) Agricultural supply corporations: The objectives are to make available inputs, such as seeds, fertilizers, pesticides and farm machinery

/to

to the farmers and also market the farmers produce at a commercial level. It also will act as the distributing agency for the products of agricultural implements factory at Birganj.

The Corporation is managed through a Board with members from the Department of Agriculture, Agricultural Development Bank, Ministry of Finance, etc. The Corporation has village level and district level organization. The implements such as foot operated thresher, bullock drawn implements, fertilizer seed drills, etc. are sold to the farmers. It is reported the Birganj branch sold about 500 implements in 1968.

(ii) National Trading Ltd.: This is a state trading agency which apart from other commercial aspects, deals with importing and distribution of tractors and farm equipment. From the past years, the National Trading Ltd. is importing 20, 28 and 48 hp tractors and implements from USSR. Narayani zone in Terai area has a branch where tractors are mostly sold. On an average 50 tractors per year are sold. From the past 7 years, 200-300 tractors have been sold. Existing sale price of Dt-20 is Rs. 11,000 and Dt-48 is Rs. 28,750. Popular horsepower range in Terai area is 20 horsepower due to its low cost. Tractors are sold on cash or installment basis, which may be 50% down payment and 50% to be paid on 36 installments at 6% interest. The tractors carry six months warranty and 3 free services are to be provided. However, no service facilities existed till recently. A modest start has been done now.

(iii) Private Farm Equipment Dealers: Only International Harvester and Massey Ferguson are sold through two organizations. These tractors are normally imported from India at the rate of 3-6 tractors a month. Recently, escorts tractors from India have been introduced. Most popular horsepower range is 35-40 hp,

/normally



normally offset disc harrow, and spring loaded cultivators are commonly used and mould board plows have been recently introduced.

Normally 4 free services and installation service is give to farmers within 6 months of sale. Price of 35 hp tractor is around Rs. 30,000. Limited facilities exists for service, although efforts are being underway to expand the same. However, the efforts are affected due to low import of about 6-12 tractors per month which has also come under complete restriction to be exported from India.

The tractors and implements are primarily used in the lower Tarai plains. The improved bullock drawn implements and hand tools developed and manufactured by the Agricultural Engineering Development and Research Section at Izanighat, Birganj are fairly cheap and are used effectively. As the production capacity of the Research Section is limited, locally made improved implements were available only on a limited scale. However, the newly established agricultural implements factory is expected to meet the requirement.

Except for bullock drawn implements, tractors and tractor drawn tillage implements no other equipment such as seeding and fertilizers, plant protection equipment, harvesting and threshing equipment are used, although there is limited usage of hand sprayers and centrifugal pumps. Milling of rice is done by rice mills run by private owners.

#### 4. Usage of Farm Machinery

Approximate hours and days the machinery used per year are as follows:

|                 |                   |
|-----------------|-------------------|
| Tractors        | 150 days (8 hrs.) |
| Plows           | 50 days           |
| Harrow          | 25 days           |
| Hand implements | 90 days           |

/5. Future

5. Future Demand of Farm Equipment

Based on the existing trend in agriculture, it is expected that there will be a demand for other equipment apart from simple bullock drawn equipment which are being manufactured now. The following table 2.1 gives the details of such estimates:

Table 2.1

Estimated Demand of Farm Equipment in Nepal (1969-1974)

| Sl  | Item   | Specification                              | Estimated Demand |                      |
|-----|--|--|------------------|----------------------|
|     |  |  | 1969-70          | 1973-74              |
| 1.  | Triding Tractor                                    | 30- 45 Hp                                  | 100              | 300                  |
| 2.  | Power tiller                                       | 8 - 10 Hp                                  | 50               | 500                  |
| 3.  | Power thresher                                     | 18" size drum for rice & wheat             | 100              | 500                  |
| 4.  | Knapsack sprayer                                   | 35 cc. 6 - 8 kg (engine operated)          | 150              | 500                  |
| 5.  | Irrigation pump                                    | 5 - 10 Hhp 20H - 30-40 ft                  | 200              | 1,000                |
| 6.  | Deep-well pump                                     | 20H 100-200 ft, 20-40 Hhp, engine or motor | 50               | 100                  |
| 7.  | a) Rice huller<br>b) Oil crusher<br>c) Flour mills | 20 Hhp engine or motor                     | 50               | 200                  |
| 8.  | Dryers   | Mobile type                                | 10               | 100                  |
| 9.  | mould Board plow                                   | Animal drawn 6"                            | 10,000           | 50,000               |
| 10. | Cultivator   | Animal drawn - 3 tine                      | 1,000            | 10,000               |
| 11. | Harrow   | Animal drawn - peg tooth type              | 1,000            | 10,000               |
| 12. | Seeder   | Animal drawn                               | 250              | Needs extension work |
| 13. | Hand sprayer & duster                              | Knapsack type                              | 100              | 1,000                |
| 14. | Pedal Thresher                                     | -  | 500              | 1,500                |
| 15. | Harvesting equip- ment                             | Animal drawn                               | 25               | 150                  |

SECTION III

MANUFACTURING AND ANCILLARY FACILITIES

1. Farm Machinery Manufactures

(i) Agricultural engineering development and research section (Birganj).

The production of hand tools and bullock drawn implements on a modest scale (about 3,500 a year) is mostly done through manual labour and smithy. The sales price of implements are low as raw material is mild steel only and is bought from scrap yards.

(ii) Agricultural implements factory (Birganj).

The management is with a board constituted by the government consisting of members of the Ministry of finance, agriculture, Planning, Industry. It is expected that very soon a corporation will be instituted to run the factory. The factory is situated at Birganj. Machine tools and equipment, construction of the factory, design and engineering services are through an aid of \$2.5 million by USSR. and land, local constructional material and personal and working capital is given by the government. Total investment is about LC Rs. 3 million. Total fixed capital invested is LC Rs. 1.25 millions.

The factory at the present is completed and is running trial production of implements. For the present total staff is about 50, with engineering staff 4, foreman 4, operators 25, others about 26.

(a) Production facilities:

Foundry - One high frequency electric furnace capacity - 50 kg a month. In the same high frequency unit is attached for necessary arrangement for heat treating tools.

/One

One cupola of 1½ tons capacity have also been set up.

Machining - lathe - 4, milling machine 1, surface grinder 1, one hacksaw shaft grinder and tools grinder, shearing machine.

Forging - Hammers -2, oil feed furnaces -2, friction press -2, granpress -3, grinder -4, painting section with conveyor and drying chamber.

(b) Type of products:

Bullock drawn

- (1) mould board plow 3 types
- (2) ridger 2 types
- (3) peg tooth harrow
- (4) hand hoe 2 types
- (5) pick axe 4 types
- (6) sickle 4 types
- (7) kurg; knife
- (8) spanner

(c) Production capacity

Though in the initial stage only the above type of tools are planned to be manufactured, the plan is to produce small hand driven machines like thresher, corn sheller, hand pump, etc.

The production capacity of the factory is 1,000 tons/year. The target for 1968-69 is 250 tons.

The following is the production target:

- |                      |                  |
|----------------------|------------------|
| (1) Nepali type plow | - 10,000 numbers |
| (2) All metal plow   | 100              |
| (3) ridger           | 1,500            |
| (4) Cultivator       | 1,000            |
| (5) Peg tooth harrow | 2,000            |
| (6) Hand hoe         | 20,000           |

|                     |        |
|---------------------|--------|
| (7) Rake            | 3,000  |
| (8) Sickle          | 5,000  |
| (9) Khurpi knife    | 10,000 |
| (10) Spanners, etc. | 20,000 |

Target is also to produce 1,000 pedal operated paddy threshers and corn shellers.

The above production target are given by a Committee consisting of representatives of Ministry of Agriculture, Industry, Agricultural Supply Corporation, Land Reform Committee, Departments of Agricultural Engineering and Agricultural Extension. The products are to be supplied to Agricultural Supply Corporation. For the first year, the present agreement with the Corporation is to pay to the factory after the implements are sold.

(iii) Sources for primary iron and steel products

The rated capacity of implement factory is 1,000 tons of steel per year. A survey was made to procure necessary supply of iron and steel from Indian market. As the result showed that iron and steel of required shape and quantity was not readily available the supply was procured from USSR. However, in 2 or 3 years it is believed that supply can be procured from other sources also. For the first 2 years of production, it planned to consume not more than 200 tons of iron and steel in each year.

Nepal has to depend wholly on other countries for the supply of steel materials required for making agricultural tools and implements. Supply of such materials has also been limiting factor for the production of agricultural implements.

2. Other engineering and Ancillary Industries

There is almost not any other industries in the country and all equipment and raw materials have to be imported.

SECTION IV

POLICY TOWARDS FARM MECHANIZATION

1. Incentives by the Government

(a) Future policy of the Government with respect to mechanization

1. The present policy is towards giving priority to bullock drawn implements. A programme for extension of the improved implements manufactured at Birganj factory will be undertaken. No definite policies towards sales promotion, credit facilities and creation of an overall organization are yet been formulated.
2. As there is a lack of supply of spare parts of tractors, the government feels that it may be necessary to encourage local manufacture of certain spare parts.
3. Training programme for farmers, mechanics of tractors and also production factory operators is necessary. But no overall policies and plans are yet set forth.
4. Regarding usage of power tillers and future demand trends, no data is available. Hence the government has not formulated any policies.
5. The government has submitted a \$1.9 million worth plan to UNDP regarding the establishment of facilities for analysis of soil, fertilities, seed certification and also starting of an agricultural college.

(b) Land Reform Saving Corporation

This was created 2 years back in order to channel the funds collected by the village ward committees towards National Development

/Projects

Projects and rural upliftment. It has received Rs. 20 million from the village ward committees up to July 1968. It has loaned 9.2 million to ward committees towards Agricultural Marketing, food distribution and mechanization activities. Granting of loans to individuals has also been undertaken. The interest rate to individuals is 10% whereas to village ward committees, interest rate is 6% who in turn lend to individuals on 10%. Loan by the Corporation to industries is on 7½% interest basis.

The following are some of the problems facing the corporations:

- (1) Utilization of funds - Identification of projects, feasibility studies and investment analysis.
- (2) Loan towards ward committees and utilization is still low.

As demand for productive credit is being insignificant.

The corporation aims to make available through village ward committees, seeds, fertilizer and extension services to 8% of the cultivated areas. Achievement last year was 4% of cultivated area.

(c) Rural Credit

The normal rate of interest through private sources is 25%. There are two organizations for extending credit to farmers.

(1) Compulsory Savings Corporation

The capital is through Land Reform Savings Corporation which has funds through the compulsory savings levied on agricultural produce, bearing an interest rate of 5%. Principle to be returned after 5 years. Loans are given to farmers mostly for the purchase of farm machinery based on the recommendation of Agricultural Extension Officer. Loans are also given for irrigation and small-scale industry.

(2) Agricultural Development Bank

Loans are normally given to purchase of seeds and fertilizers. The loans are restricted to crop production short term loans.

2. Rural Development

Before 1950, projects constructed by government agencies after due technical considerations irrigated only 14,600 ha. acres of land in the Terai. The following table, indicating the area served by projects constructed by the Department in different plan periods, indicates the scope of development.

| <u>Description</u>  | <u>Area served in hectares</u> |
|---|--------------------------------|
| 1. Area irrigated before 1950   | 14,600                         |
| 2. Total area irrigated at the end of first Five Year Plan (1956-57) to 1961-62                   | 32,200                         |
| 3. Total area irrigated at the end of second Five Year Plan (1961-62 to 1964-65)                  | 58,000                         |
| 4. Estimated total area irrigated after completion of the 3rd Five Year Plan (1964-65 to 1969-70) | 220,000                        |

(a) Major projects

Good progress has been maintained in the construction of the three major projects in the Terai as listed below:

| <u>Project</u>  | <u>Actual area served in hectares</u> |
|-----------------|---------------------------------------|
| 1. Chatra Canal | 61,000                                |
| 2. Gandak       | 58,000                                |
| 3. Kamala       | 26,600                                |

/(b) Minor



(b) Minor irrigation projects

Minor irrigation schemes costing generally less than about \$10,000 have been taken up in all twenty districts of the Terai and more than ten districts in the midlands. In the year 1967, more than a hundred such small scale projects were completed, providing irrigation facilities to more than 40,000 ha of land in different parts of the country. The experience of the last year indicates the highly successful results of this kind of irrigation development.

(c) Groundwater

There are innumerable shallow wells in the Terai, used particularly for vegetable cultivation. Deep tubewell construction by private enterprise has been negligible because of the initial cost and difficulties of transportation. Under the Minor Irrigation Scheme this year, 28 deep tubewells of varying depths up to 150 meters have been sunk in four different districts of the Terai. They are expected to serve about 60 ha each and more will be constructed next year.

(d) Projects under investigation

The survey which began in April 1968 is expected to be completed by end of 1969. The project when developed will cost about 2.1 million dollars and will irrigate 320,000 ha.

Other Measures

(1) Size of the Holding (Ceiling)

Most of the farmers now have about 5 ha ceiling on the individual family holdings and all is about 40 acres. Exemption on ceiling may

/granted to

granted to undertaking of commercial crops.

(2) Agricultural policies to promote the development of the other agricultural inputs:-

There is Agricultural Supply Corporation for supplying fertilizer, pumping sets, imported seeds, pesticides, fungicides etc. to the farmers on recommendation from Agricultural Research Department. There is no import duty on tractors, their implements and machineries.

(3) Management of farm equipment by co-operatives:-

There are some co-operative societies for the management of farm equipment by co-operatives.

(4) Government floor and subsidy prices for selected crops:-

There are no government floor and subsidy prices for selected crops.

3. Research and Testing

Agricultural Engineering, Development & Research Section (Birganj)

The section is primarily engaged in development and limited manufacture of hand tools and bullock drawn implements. About 3,300 implements were produced during 1967-68. With the establishment of the implement factory, this section is expected to concentrate more on development, research and prototype fabrication and extension.

4. Training and Extension Service

Agricultural Stations

There are 6 agricultural research and extension stations. They are at Doti (Hillside) and at Nepalgonj, Viratnagar, Rampur, Birganj, Janakpur.

/They are

They are engaged in evolving improved seeds, poultry etc. The Birgong station has facilities for training in farm management, irrigation and agronomy. The stations normally have about 50-100 acres of farm, and usage and limited research on farm equipment is also carried out. For example at Hampur limited work is being carried out on corn drying.

/SECTION V

SECTION V

POLICY TOWARDS INDUSTRIALIZATION

(a) The first priority has been given to the manufacturing industry for agricultural machinery in the current national development plan. Keeping the facts in mind, the agricultural tools and implement factory has been set up at Birganj. There is government budget to this agricultural tools and implements factory Birganj since last two years.

(b) Measure to attract national as foreign capital into this field including export incentives:-

- (i) No income tax is levied for such industry for the first 10 years.
- (ii) The industry can utilize 65% (average) of the foreign exchange earned by export.

/SECTION VI

SECTION VICONCLUSIONS

1. Nepal constitutes a very small market for tractors, power tillers and engines which cannot be expected to be produced locally.
2. Maintenance and service for this power equipment in use and mainly for tractors have to be improved and facilities must be offered for a better supply for spare parts.
3. Even local producing of other equipments like pump and sprayers can be hardly considered because of small demand and limited facilities for manufacturing and supply of raw materials.
4. The new factory of Birganj could be of great help to the Nepalese farmers if it could produce economically various simple implements which are urgently needed.
5. Starting of this new factory has brought up new set of problems which were not existing before. The immediate problem is the utilization of full producing capacity, existing utilization being hardly 25%.
6. It is proposed the ways of actions as follows:-
  - (a) A new study of the local market to estimate realistically the amount of the demand for simple farm implements, the main technical needed for the same and merely the maximum price that can be offered for them by the farmers.
  - (b) The setting up of a small engineering and testing facilities in collaboration with Agricultural Engineering Development and Research Station

/for

for selection, design and improvement of the suitable implements to be produced by the factory taking into account the production equipment of the same.

(c) To improve the methods of manufacturing by inviting foreigner factories engaged in similar production (India, Ceylon).

(d) For the government to give temporary subsidies for implements produced - either to the factory for a lower selling price or to the farmers to allow them to buy this equipments.

(e) Considering the actual production facilities and merely the forging capacity emphasis appear to be given to mass production of hand tools like spdes, axes for which exports channels has to be explored. Other implements like bullock plough and cultivating, threshing, seeding and weeding will be available merely for local market.

(f) Manufacture of centrifugal and hand pumps, hand sprayers, paddy threshers etc. may be explored.

As only a suggestion one man must be really responsible for all this action.

APPENDIX A

REFERENCES

1. Report on Industries Manufacturing Agricultural Machinery -  
UNDP Nepal and counterparts report.
2. Country Progress Report on Irrigation Development in Nepal -  
Seventh NUSA Irrigation Practices Seminar Lahore, Pakistan  
1968.

APPENDIX B

PERSONS AND ORGANIZATION VISITED

1. U.M.D.P. Katmandu:
  - (a) Mr. Jacob Joury - Resident Representative
  - (b) Mr. Issinski - Deputy Resident Representative
2. Department of Industries; Ministry of Industries and Commerce, H.M.G. Government, Nepal  
Lal Darbar, Kathmandu, Nepal
  - (a) Mr. G.L. Raj Bhandari, Director of Industries
3. Department of Agriculture, Ministry of Agriculture:
  - (a) Mr. N.B. Bannet - Director of Agriculture
  - (b) Mr. T.B. Bannet - Chief Agricultural Engineer
  - (c) Mr. S.N. Regal - Agricultural Engineer
4. Agricultural Engineering Development and Research Section:  
Department of Agriculture, Birganj:
  - (a) Mr. B.K. Shrestha - In-Charge.
5. National Trading Ltd.  
Narayani Zone, Birganj
  - (a) Mr. A.P. Bhattarai - In-Charge.
  - (b) Mr. G.N. Shrestha - Engineer
6. Agricultural Supply Corporation:  
Birganj:
  - (a) Mr. Pandey - In-Charge
7. Bhajuratna Engineering & Sales (p) Ltd.  
Birganj:
  - (a) Mr. P.V. Menon - Manager
8. Bhajuratna Agency Ltd.  
Birganj:
  - (a) Mr. M. Ratna
9. Parwanipur Agricultural Station:  
Birganj:



(a) Mr. J.H. Joshi - Manager

(b) Mr. James T. Grider - Agricultural Advisor  
U.S. Peace Corps.

10. Agricultural Tools Factory:

Birganj:

(a) Mr. R.N. Suwal - Project Manager

(b) Mr. Semyonov - Expert from USSR

(c) Mr. Rameswara Sharma - Adm. Officer

11. Land Reform Savings Corporation:

Nepal Bank Building, New Road  
Kathmandu,

(a) Mr. Prem K. Shrestha - General Manager.



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