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COUNTRY STUDY REPORT

on the

STATUS OF AGRICULTURAL MACHINERY INDUSTRY

in

I R A N

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

SUMMARY OF COUNTRY STUDY - IRAN

1. General pattern of agriculture

Iran with about 15 million rural population out of 26 million total is predominantly an agrarian country. Only 6.85 million ha or 4.2% of total land is under cultivation and additional 9.5% could be cultivated in the future. About 45% of the actual cultivated land is under irrigation. Wheat, barley, pulser, rice and cotton are major crops. Rice is mostly grown in Caspian coastal area. About 18% of the holdings are about 10 hectares. The Land Reform Laws have bestowed the rights of ownership on the farmer tiller. From the past five years, there has been a greater usage of farm machinery and equipment.

2. Pattern farm mechanization

Agriculture in Iran is being significantly mechanized with 20,000 tractors, 10,000 pwer tillers and 1,500 combines in use.

Projected demand for 1970 will be about 4,000 tractors mostly in the range of 55/65 Hp with their matched implements, 5,000 power tillers, 300/500 combines. There will be also a good scope for engines, pumps, sprayers, paddy threshers, seed drills, prinklers for irrigation and sugar beed harveters.

The government owned institute for farm machinery development deals with exclusive importing and distribution of 45/80 Hp tractors from Rumania and will also acts as the sole distributor for the same to be manufactured in the State tractor factory in Tabriz.

3. Manufacturing industries and ancillary facilities

Plans are underway for progressive manufacturing of 5000 Rumanian tractors a year in a new plant being constructed in Tabriz with a target of

/10,000

10,000 in 1972. Two others governmental plants will produce diesel engines, pumps and tractors implements.

In the private sector, one company is assembling about 500 tractors/ year. A power tiller factory is manufacturing power tillers with 60% local content. About 3,000 power tillers, 500 trailers, 1,200 rice threshers and implements are produced per year and the manufacturing facilities can be expanded.

Machine tool building, steel and fertilizer plants are other allied engineering industries which may start operating by 1972 on full capacity. There are no significant ancillary and supporting industries. There is also a short supply of engineering personnel, and industrial operators.

4. Policy towards farm mechanization

No import duty on farm machinery and spares, crop floor prices, rural credit, mechanized units for custom work are some of the steps by the government towards mechanization. The IV plan stress the importance of agriculture and supply of inputs. The Agricultural Cooperative Unions, Farmers and Agro-Industrial and Agricultural Joint Stock Companies are some of the organizations for farm mechanizations and development of agriculture.

Research and testing facilities are limited. However, the Machinery Research Division of the Agricultural Engineering Research Center, Karaj is a contribution to a significant magnitude in this direction. There is two agricultural college and agricultural engineering division.

5. Policy towards industrialization

The general trend of economy is very favourable. The incentives towards investment are attractive

6. Conclusions

Iran is a good market for powerful tractors, power tillers and other conventional type of farm machinery. The forementioned plans which are under progress are expected to give ~~x~~ to this country a good ratio of self sufficiency for the most of these items and export in other countries could be considered.

As government has no plans to manufacture power tillers, private sector has to be encouraged for expanding the production of power tillers and also for manufacturing other implements such as sprayers, crop processing machinery etc. Fabrication of combines may be considered in future in collaboration with neighbouring countries.

/SECTION I

SECTION I

GENERAL PATTERN OF AGRICULTURE

Iran which lies between 25° to 40° North Latitude and 44° to 64° East Longitude is predominantly agrarian country where 70% of the population is engaged in agriculture or agriculturally related industries. Out of total population of 25.8 million, rural population is 15.3 million living in 49,000 rural villages. Iran - next to Australia - has the highest arable land per capita of 0.7 ha among countries within ECAFE grouping.

1. Land utilization

a) Land distribution by nature

Table 1.1 gives details of agricultural and other land use.

Table 1.1 Land utilization by nature

	(Hectares) (000)
Total area	164,800
a) Land under annual cultivation	6,400
b) Artificial pastures	130
c) Orchards, woodlots and gardens	325
d) Fallow	4,800
e) Natural pasture	6,745
f) Land which could be utilized without much cost for development	4,100
g) Forest	18,000
h) Waste lands, mountain, saline lands and desert	81,000
i) Water, towns, villages, roads	43,300

Thus, actual land under effective cultivation is only 6.85 million

/ha.

ha which is 4.27% of total land, whereas about 15.6 million ha or 9.5% to total area as shown in table 1.2 could be brought under plow without much cost.

Table 1.2 Actual land potential area available for agriculture

Total geographical area		100.0
1) Effective area under cultivation		4.2%
2) Potential area		9.5%
Fallow	2.9%	
Natural pasture	4.1%	
Above marginal land	2.5%	

b) Land distribution by crops and agricultural production

Out of 6.85 million areas that is under effective plowing, about 2.91 million hectares were irrigated and 3.94 million hectares were under dry farming. The distribution pattern of crop areas and estimated production are given in table 1.3.

/Table 1.3

Table 1.3 : Crop areas, yield and production (1967)

Crop	Area 1000 ha	Yield tons/ha	Total production million tons
Total cultivated area	6,400	-	-
Total food crops (including barley and pulses)	5,200	-	-
Rice	360	2.7	0.94
Wheat	1,595	1.35	4.6
Barley	-	-	1.0
Beans	-	-	0.1
Sugarbeat	122	23.2	2.0
Cotton	360	1.3	0.38
Tea	25	2.40 (wet)	0.16 (dry)
Sugarcane	5	-	0.4
Oil seeds	-	-	0.3
Fruits	-	-	0.1
Vegetable	210	-	-

c) Land distribution by size of holding

It is estimated that 50% of land owned is by holdings of less than 3 ha, 32% of by holdings of 3-10 ha and 18% is by holdings of above 10 ha. Average acreage per holding is about 3.07 ha.

d) Land distribution by type of holding

Before the introduction of Land Reform Acts in 1961, most of the agricultural lands were tenant cultivated. However, the ownership pattern has greatly changed since.

e) Land Reform

The Land Reform of Iran is the first and the main item of the social and economical evolution of the country initiated by the Government in 1961,

/which

which has completely reorganized the rural life and structure of the country. Since 1961, the number of own cultivation is reaching a figure of above 7 million persons (head of the family). The average holding size of these cultivators is about 10 ha. Each farm has the right to the ultimate ownership of the land that he is tilling. The Land Reform Programme is being carried out according to the following phases.

Phase (i) - This has been implemented during 1961-63. It covered about 50,000 villages. The lands of landloards who had mofe than one village was bought by the government on a 15 year payment programme and distributed to the farmers. About 16,000 villages were reorganized thus, The payment to the landlords were based on the farm income-cultivated on a co-efficient of tax paid by the landlord - for 10 year period.

Phase (ii) - The amount of rent and lease scheme were reorganized from 1963-67. As a result, about 1.86 million farm families were shifted from the crop sharing peasantry system to the cash rental arrangement for a period of 30 years.

Phase (iii) - The new amendment of the Land Reform Law introduced in 1967 considers the right of ownership to be passed on to the owner cultivators through government assistance. In general Land Reform Laws aim at farmer ownership of the land. However, true willbe no limit of the ownership of mechanized farms. Although "mechanized farms" are considered as those which has mechanized means of cultivation, maintenance and harvesting, the present concession includes those which are cultivated by mechanized power. In the case of land cultivated by owners in dry farming, the average size is approximately 10 ha while in the irrigated lands, the average size is estimated to be about 5 ha.

/2.

2. Cattle population

There are about 5.51 million heads of cattle. Most of the cattle is used in farming.

3. Farm income

The intensive cultivation of paddy is normally practiced in Caspian area. Yield of paddy (white rice) of native variety is 2 tons/ha whereas the improved Japanica variety is as high as 6 tons/ha. The average farm harvest prices are as follows:

Table 1.4 : Farm Harvest Price of Rice

Type	Class	Price Rials/kg
1. Native Rice	I	30.0
	II	26.5
	III	24.0
	IV	22.0
2. Japanica rice	Chanpaka	15.0
3. Wheat native	-	60.0

Most of the paddy area is under native variety. Considering an average holding size of 3 ha of paddy, and 2 tons of rice/ha yield at farm harvest price of 25 rials/kg, average farm income per rice holding is about Rials 150,000 or $2,000/per holding per season in Caspian paddy area. Most of the area has one crop of paddy only. Maximum paddy area per holding does not exceed 10 ha.

4. Farming pratices

(i) Paddy: Land is plowed twice, first in February and again in April for rice cultivation. Draft animals take 7 days and power tiller 3 days/ha/plowing. Most of the area is transplanted. About 2-3 hours/ha for

/broadcasting

broadcasting and about 20 man/days for transplanting per hectare is necessary. Top dressing of fertilizer requires 1 manday/ha. The amount of water required for clay soils is 8,000 to 10,000 cubic meters per ha, and for most of paddy lands 18,000 - 20,000 cubic meters of water is needed per hectare. Harvesting is done normally by hand. About 5 man/days is required per hectare. Threshing is also done normally. Recently usage of power tillers and paddy power threshers have been introduced.

(ii) Dry farming: The main crops in most of the other agricultural areas where annual precipitation is low are wheat, pulses and cotton, wheat and barley are broadcasted for sowing. In slopes and mountain areas, farming practices are through manual and draft animal power. In plains, tractors are used for tillage and combine harvesters are used for harvesting the grain.

(iii) Farm machinery usage: The 1960 census of agriculture reported that about 74.9% of the farmers use animalpower., 5.9% animal and mechanical, 15.4% use only human labour and 3.8% use only mechanical power. Of the farms using tractors only about 3% use their own equipment; others use custom tractors serives. However, since 1965, due to larger import of farm equipment, the above pattern of usage has significantly changed.

(iv) Irrigation: Irrigation is one of the most promising means of increasing production, and this area has been allocated about 35% of the total development funds for agriculture. Other areas x receiving large allocations are agricultural credit and land tenure improvement which receive 19 and 12% respectively of the total. During the III plan period as of 1960, of the land that is cultivated, about 62% is dry farmed. Only about 38% of the wheat and barley is irrigated. Together they account for 73% of the irrigated land. Over half the cotton and most of the sugar beets are irrigated. As of 1963,

/a total

a total of 4,651,000 hectares were under irrigation. This is equivalent to about 13.6% of total arable land irrigated. Proposed project will extend irrigation to an additional area of 140,000 hectares. Priority is given now to sprinkler irrigation.

/SECTION II

SECTION II

PATTERN OF FARM MECHANIZATION

1. Farm Machinery Population

No agricultural machinery census has been carried out. However, considering the import figures from the past three years and import trend from 1960, taking into account the agricultural development trend, the following is the estimated farm machinery population:

Table 2.1

Estimated Farm Machinery Population (1968)

Item	Numbers
1. Tractors	20,000 - 25,000
2. Power tillers	10,000 - 12,000
3. Diesel Engine stationary type (Agricultural Usage)	20,000 - 30,000
4. Deep-weel pump	10,000 - 15,000
5. Hand pump	60,000 - 80,000
6. Hand sprayers	100,000 -125,000
7. Sprayer (power operated)	18,000 - 20,000
8. Fertilizer spreaders	400 - 600
9. Seed drills	1,500 - 2,000
10. Cultivators	10,000 - 15,000
11. Cold crushers	800 - 1,000
12. Mowers	800 - 1,200
13. Combine harvesters	1,000 - 2,000
14. Paddy threshers (power)	1,000 - 1,200
15. Rice hullers (Small)	2,500 - 3,000

It is interesting to note that there were only 6,000 tractors and 750 combine harvesters in use in 1961.

2. Import and Production of Farm Machinery

(a) Import: From 1960, there has been continuous import of farm

/machinery

machinery and from 1965, the volume of imports have been greatly increased; as shown in Table 2.2. Appendix 2.1 at the end of this section gives the details of the countrywise import to Iran.

(b) Production: No realiable data regarding indigenous manufacturing of farm machinery is available. There are a few units making plows, disc harrows, cultivater pumps (centrifugal and deep-well) etc. But the volume of production is limited. The following are the production figures of a tractor and power tiller factory operating in Iran:

Table 2.3: Production of Farm Machinery

	1965	1966	1967	1968
1. Tractors (30-40 Hp)	Estimated about 400 - 500/year			
2. a) Power tillers	800	1,200	1,500	3,500
b) Semi-automatic paddy threshers	-	570	760	1,200
c) Small trailers (for power tillers)	-	140	200	500
d) Small plows, cage wheels, etc.	data not available			
e) Pump (including hand pumps)	2,575[x]	3,000	3,500	Data not available
f) Deep-well pumps	187[c]	260	610	

Note: x 1950 in 1965; c 100 in 1964

Table 2.2: Import of Farm Machinery to Iran (1965-68)

Machine	1965-66	1966-67	1967-68
1. Tractors[a/]	3,879	3,093	3,247
2. Power tillers	-	-	2,570
3. Tractor engine	50	5	13
4. Diesel engine stationary, agricultural usage	210	227	371
5. Deep-well pump	1,673	2,671	2,731
6. Hand pump	3,924	11,218	8,420
7. Hand sprayers	16,968	26,519	23,579
8. Sprayers - Machine	1,334	1,630	8,973
9. Fertilizer spreaders	56	94	134
10. Seed drills	301	108	658

/11.

Machine	1965-66	1966-67	1967-68
11. Clod crushers	225	183	50
12. Cultivators	NA	2,004	4,238 b/
13. Mowers	160	227	69
14. Combine harvesters	54	62	369
15. Threshers	303	149	812

Note: a/ Includes all type 2 tractors - imports 1961 (2,500 units), 1962 (1,800 units), 1963 (1,566 units), 1964 (2,728 units).

b/ Includes 1870 rotary tillers from Japan

3. Demand and Sale of Farm Machinery

(A) Demand and Sale: The demand and sale of farm machinery - as most of the same are imported - has to be viewed with respect to the policies of the government with respect to imports.

(a) Tractors: During 2nd and early part of the III plan period, 12,000 tractors were imported consisting of 52 different types. 12 types out of 52 makes were financed by the government. Due to difficulty in recovery of loans to the farmers, government had to take legal action on about 2,000 farmers.

The present policy of the government is towards standardization of makes and horsepower through the following import policies:

(i) 35-80 Hp - a) Normally fully built-up tractor import is restricted;

b) Fully built-up tractor models in the horsepower range of 40-70 Hp which will be manufactured by the state enterprise is allowed to be imported through state agency.

c) Components for 35-40 Hp tractor model which is locally assembled is allowed to be imported (for B.M. Va...

/(ii)

(ii) Less than 35 Hp - Import restriction does not exist. However,

(iii) More than 90 Hp clearance from the Ministry of Economy is necessary.

The present demand for tractors for agricultural usage is expected to be about 3,000 - 3,500/year.

(b) Power tillers: Power tillers were introduced in 1960. With emphasis on multi-cropping of paddy in Caspian area, the demand for power tiller today is appreciable. The present demand is estimated to be about 4,000/units/year.

(c) Engines: Both stationary engines and high speed engines are imported. Manufacturing plans are underway.

(d) Pumps: Most of the pumps and all deep-well pumps are imported. Usage of hand pumps is very much limited. Power centrifugal pumps 2" - 8" and deep-well pumps have a demand.

(e) Sprayers and Dusters: Problem of plant protection has been very well considered in IV plan. For the present hand sprayers, trolley mounted sprayers are imported on a significant scale. About 22,000 hand sprayers and 3,000 power sprayers were imported on an average from 1965-66 to 1967-68. There are no manufacturing facilities now.

(f) Threshers: i) Paddy: Demand for pedal operated threshers is nil. There is a demand for about 500-600 power threshers for the present per year.

ii) Wheat: It is reported that the demand for power threshers is nil as a few threshers imported a few years back were not successful; and accepted by the farmers.

/(g)

(g) Rice hullers: Present demand for 0.5 - 1 ton/hour rice hullders is about 300-400 units/year.

(h) Combine harvester (Wheat): The present import is about 300 combine harvester per year. About 4 million ha or 25% of wheat area is combine harvested. Presently Massey Ferguson, B.M. Volvo, Allis Chalmers, Ransomes, and Combine harvesters from USSR and Poland etc. are used.

(i) Other equipment: i) Sprinkler irrigation system: Components such as nozzles, enginec, and other items are imported. Locally the tubes are manufactured in Iran.

ii) Other implements: Although a few tractor drawn implements such as disc harrow, cultivator etc. are manufactured locally, a significant percentage is imported. Other implemants are through imports only.

(B) Organization for Sale and Service of Farm Machinery: There are both state owned and private organizations.

(a) State Sector Organization: There is only one sales and service organization for all "universal tractors" of 45, 52 and 65 Hp imported from Rumania and the same to be made in the state tractor factory in Iran.

Institute for Farm Machinery Development: This operates under the Ministry of Agriculture. This was started by the government 12 years ago. Previously this was engaged only in financing 12 types of tractors and implements for sale to the farmers. Now the Institute buys tractors of 45, 52 and 65 Hp from the State Company of Rumania at the rate of 3,000 units/year and distributes through 40 private agents throughout the country. It has 12 branches in provinces with a total staff of

/400.

400. Only 2% of sale is on cash payment. The rest is on 6 years, 12 installment basis at 5% interest with 7.15% down payment by the farmer. The price of the tractor includes 7 free services to be rendered by the sales agent within first 2,000 hours. Warrenty claim is honoured for claims within 2,000 working hours. The sales agent gets Rials 10,000 per tractor as sales commission and about Rials 8,000 for rendering free services. 20% commission is given for all spare parts sales. The Institute has an inventory of US$2 million worth spare parts. The Institute makes 12% margin on spares including depreciation on inventory and 15% margin on tractor sales.

There are 3 repair centres under construction at Mased, Shiriz and Hamadon. These centres are for repairs to be rendered for tractors after 2,000 hours working, for major overhaul. There are representatives from the collaborating country (Rumania) at every sales point, one person for every 100 tractors. It is interesting to note that farmers of Gorgan area has bought more than 2,500 tractors and 800 combine through this Institute financing system.

The Institute for farm machinery development will act as the sole distributor for the tractors produced by the State Tractors Company at Tabriz. The present sale price of imported tractors sold through this organization is as follows:-

/Model

Model	Hp	Drive	Price Rial
Rumanian 651	65	4 wheel	245,000
650	65	2 wheel	220,000
520	52	"	180,000
450	42	"	165,000

For the present model 651 has 80% of sales. In general, 65 Hp tractor is more popular. However, there are no farmers on waiting list. The present popular implements are cultivator, disc harrow and mould board plow.

(b) Private Organizations: There are many private dealers in the field of farm machinery. However, due to import restrictions for tractors in the range of 35-80 Hp, the sales activities are limited. Regarding power tillers, the existing manufacturer has about 40 main dealers and 40-50 sub-dealers.

4. Usage of Farm Machinery

The present usage mainly consists of tractors and tractor drawn implements on plain lands, powertiller and implements, power threshers and rice hullers in paddy area, sprayers and dusters in wheat, beet root and cash crop area, and self-propelled combines in plain wheat areas. Animal drawn implements manufactured by village blacksmiths are normally used by small farmers.

5. Future Demand and Trend in Design

Iran has a great potential towards usage of farm machinery. Intensification of paddy in caspian area, land development deep-well pump installation, irrigational facilities in upland area and plains for wheat provides maximum opportunity for farm mechanization. Details of the future demand and trend in design is summarized in table.

/(a)

(a) Tractors: In general, total tractor demand by 1970 may be in the order of 4,500 units, 7,000 - 10,000 units by 1975. The present trend appears to be in the range of 60-70 Hp tractor usage. These are mainly used for dry land cultivation. The present import of such models includes tractors with 4-wheel drive. The popularity of the 4 wheel drive models in the range of 60-70 Hp currently imported may be due to its low price difference compared to similar 2 wheel drive. However, it is felt that with local manufacture, the price difference between 4-wheel drive and 2-wheel drive will be significant - which is not the case with imported models - and then, two-wheel drive may be more attractive. Thus, it is expected that there will be greater demand for tractors in the range of 60-70 Hp. Considering 35-40 Hp medium size tractors, although present demand is low, due to non-availability in the country, it is felt that there will be appreciable demand for such tractors in both light soil areas and paddy areas and for raw-crop cultivation.

(b) Power Tillers: The present market trend is towards $4\frac{1}{2}$ Hp (50%) and 7 Hp (35%). However, with the larger area and intensity of paddy cultivation in Caspian area and also in other plain areas with irrigational facilities, the demand for power tiller is expected to increase. It is also felt that in future 8-12 Hp power tillers will become popular.

For the present, cost of fuel is Rials 6.0/lit for gasoline, 2.4 rials/lit for diesel and 2.5 rials/lit for kerosine. Although

/production

production of diesel and kerosine power tiller is equally divided today, in future, with 8-12 Hp power tillers it is expected that diesel engines will be more popular, The demand is estimated to reached 5,000 by 1970 and 10,000 by 1975.

(c) Engines: There will be a demand for micro 1-2 Hp and 3-5 Hp gasoline engines and 5-15 Hp diesel and 12-30 Hp stationary diesel engines. About 30,000 engines of all types per year is expected to be the demand by 1970.

(d) Pumps: There is no demand for hand pumps. 2"-8" centrifugal pumps will be largely used by farmers. Although there is a demand for deep well pumps (about 3,000 by 1970), the further demand will depend upon the policy of the government.

(e) Sprayers and Dusters: The demand for hand sprayers in 1970 will be about 25,000. However, demand will increase for knapsack sprayers and trolley mounted sprayers. There will be a good market for tractor mounted sprayers also.

(f) Threshers: i) Paddy: Demand in future for pedal threshers will be nil. Demand for power threshers is expected to be 1,200-1,500 by 1970.

ii) Wheat: For the present no wheat threshers are in active use. Usage of combines are popular, but quantity is not very high. To meet the requirement of a "class" of farmers and taking into account the usage pattern in West Pakistan and India, there appears to be a necessity to introduce power wheat threshers.

/demandd

Demand is expected to be about 500 by 1970.

(g) Rice Hullers: Demand for 1 ton/hour rice hullers is expected to be about 600-700 units by 1970. However, the actual capacity required and demand needs further detailed investigation.

(h) Seed Cleaners: No manufacturing programme exists. There will be a demand and good scope for manufacture.

(i) Combine Harvesters: a) Rice: No combine harvester is in usage. There is a necessity to introduce the same on an experimental basis.

b) Wheat: There is a good scope for combine harvesters. There could a place for local manufacture of self-propelled combines.

(j) Mechanization of Sugar Beet: A light 30-45 Hp row-crop tractor is required in this field. About 60,000 ha of sugar beet is under package plan of integrated input and credit supply. For the present beat lifters are imported from Israel, Germany and U.S.A. There will be scope for sugar beet harvesting machine.

(k) Cotton Pickers: IV plan has no program in this field. It is felt that it is "too early" for the present to introduce the same on a mass scale. Although there is a need for cotton pickers, it is necessary to introduce the same on an experimental scale.

(l) Other Equipment: a) Sprinkler Irrigation System: Ministry of Water and Power have given special priority for the same. There is irrigation loans for deep-well pumps, pumps and sprinkler irrigation system. There is a good scope for local manufacture.

/b)

b) Other Implements : There is a good scope for manufacture of disc plows, mould board plows, cultivators, harrows and seed/ferti drills. The government has plans to manufacture a few items in the state factory.

/Table 2.3

Table 2.3 Summary of Future Demand and Trend in Design of Farm Equipment in Iran

No.	Item	Specification	Future Demand
1.	Crawler tractors	80-150 Hp	About 50/year is the present demand. It may go up to about 200/year by 1975.
2.	Agricultural Tractor	a. 20 Hp Small (1000 - 1200 kg)	For orchards, gardens. About 300/year by 1970. Demand may go up if suitable for paddy cultivation.
		b. 35-40 Hp Row Crop	For sugar beet, About 500 per year by 1970. Demand for standard types may go up if used on paddy and for dry land crops.
		c. 50-90 Hp	60-70 Hp appears to be most popular. About 3,500 units per year by 1970, 6,000 - 7,000 by 1975 and about 10,000 per year by 1978-79.
		d. 90-120 Hp	About 50 units by 1970 per year and about 200 units by 1975.
		e. Total tractor dem.	About 4,000-5,000 by 1970 and 8,000-10,000 by 1975.
3.	Power Tillers	a. 6-8, 8-12	The present demand is about 4,000 units/year. The demand by 1970 is expected to be about 5,000 units and may reach 10,000 by 1975.
4.	Engines	a. 1-2 Hp gasoline	Demand for micro engines for plant protection is expected to be 15,000 by 1970.
		b. 3-5 Hp gasoline	For usage of pumps and light application, demand is expected to be 4,5000 by 1970.
		c. 3-15 Hp diesel	For usage on power tiller, pumps etc. demand is expected to be 10,000-12,000 by 1970.
		d. 12-30 Hp diesel	For usage on deep-well pumps, demand is expected to be 4,000 by 1970.
5.	Pumps	a. Centrifugal 2"-8"	Demand is expected to be about 10,000 by 1970.
		b. Deep-well	Demand for deep-well pumps is expected to be about 3,000/year by 1970.
6.	Sprayers & Dusters	a. Hand Operated	Demand is for about 25,000 by 1970. Trend further will be towards knapsack sprayers.
		b. Power Sprayers	Knapsack and trolley mounted engine driven sprayers will be popular. Total demand about 12,000-15,000/yr. by 1970. Demand for tractor mounted sprayers also.
7.	Threshers	a. Paddy (power)	Demand 1,200-1,500 by 1970.
		b. Wheat (power)	Demand 500 by 1970.
8.	Rice Hullers	a. 1 ton/hour	Demand by 1970 about 600-700 units.
		b. 3-5 ton/hour	Requires further investigation.

No.	Item	Specification	Future Demand
9.	Seed Cleaners	Rice & Wheat	Good scope for manufacture.
10.	Combine Harvester	a. Rice	Introduction on experimental scale necessary.
		b. Wheat	The present import of about 300/year is expected to go up. There are scope for local manufacture of self-propelled combine harvesters.
11.	Sugar beet Harvesters	a. Beet Lifters	Good scope for local manufacture.
		b. Automatic Harvesters	Necessity to introduce on a significant scale. Scope for manufacture exists.
12.	Cotton Pickers	-	Necessary to introduce on experimental scale.
13.	Other Equipment	a. Sprinkler Irrigation	Good scope for local manufacture.
		b. Tractor Drawn Implements	Good scope for local manufacture especially seed drills/fertilizers distributors, mould board plows, cultivators, etc.

APPENDIX 2.1

Import Statistics of Agricultural Machinery to Iran

(countrywise)

Country	1965-66	1966-67	1967-68
I. Tractor Engine			
India	-	5	
West Germany	2		
U.K.	12		12
France	4		
U.S.A.	31		
Total	50	5	13
II. Diesel Engine Stationary - Agricultural			
U.K.	186	221	247
West Germany	15		
Total	210	227	371
III. Deep-well Pumps			
India	286	262	267
West Germany	157	121	591
U.K.	167	187	331
U.S.A.	760	1,787	1,246
Total	1,673	2,671	2,731
IV. Hand Pumps			
Japan	221	795	570
West Germany	2,810	2,966	3,176
Italy	-	2,985	1,641
Czech.	620	1,060	1,200
Sweden	220	575	462
Poland	-	2,250	400
U.S.A.	-	-	801
Total	3,924	11,218	8,420
V. Hand Sprayers - Agricultural			
Japan	504	70	3,664
West Germany	7,638	5,616	8,334
Italy	1,350	218	508
U.S.S.R.	2,901	-	-
Yugoslavia	-	4,100	6,211
Netherlands	1,250	61	450
U.S.A.	1,856	13,216	1,189
Total	16,968	26,519	23,599

Country	1965-66	1966-67	1967-68
VI. Sprayers, Agricultural Machine			
Japan	80	155	955
West Germany	467	185	1,907
Netherlands	630	450	726
U.S.A.	128	691	24
Total	1,334	1,630	8,973
VII. Spreader - Fertilizer			
Israel	29	8	2
Netherlands	17	64	115
Total	56	94	134
VIII. Seed Drills			
West Germany	-	40	47
U.S.S.R.	-	40	5
U.S.A.	273	23	583
Total	301	108	658
XI. Clod Crushers - Harrow			
U.K.	54	100	45
U.S.A.	48	83	5
Total	225	183	50
X. Cultivators			
Japan		485	1,870
West Germany		271	118
U.K.		287	49
Romania		630	2,189
U.S.S.R.		137	4
U.S.A.		134	7
Total		2,004	4,238
XI. Mowers			
West Germany	10	12	5
U.K.		19	1
Italy	-	-	53
Sweden	24	20	-
U.S.S.R.		20	
Poland		20	
France	20	30	
U.S.A.	-	104	9
Total	160	227	69

Country	1965-66	1966-67	1967-68
XII. Combine Harvester			
Sweden	10	25	32
U.S.S.R.	-	-	25
France	30	13	51
West Germany	-	-	41
Total	54	62	369
XIII. Threshers			
Japan	301	90	800
U.K.		10	10
U.S.S.R.		30	
Total	303	149	812
XIV. All Types of Tractors			
Japan	1,130	566	4
East Germany	150	-	24
West Germany	567	183	36
Austria	200	60	
U.K.	942	317	158
Italy	298	103	7
Sweden	214	-	100
U.S.S.R.	16	109	58
France	13	34	13
Rumania	-	-	2,664
Pland	30	25	5
U.S.A.	294	254	166
Total	3,879	3,093	3,247
XV. Hand Tractors			
Japan	-	-	2,544
West Germany	-	-	15
U.K.	-	-	1
Total			2,570

SECTION III

MANUFACTURING INDUSTRIES AND ANCILLARY FACILITIES

1. Farm machinery manufacturers

I. Public sector projects

Organization for renovation of industry

This body is under Ministry of Economy and is responsible for all state enterprise manufacturing activities. The two plants under construction are:

(a) Metallurgical and Engineering Plant - Tabriz

It consists of two plants. Plant No, I - with Czechoslovakian collaboration - will produce machine tools, presses, compressors, pumps, diesel engines, and electric motors. Plant No. II - with Rumanian collaboration - will produce tractors.

The total plants land area has 65 ha with additional 60 ha reserve area. Total covered area will be 120,000 sq. meters (12 ha) with 3,750 workers when completed.

Total investment is expected in the order of US$60 million.

(i) Plant No. I - Diesel Engines and Pumps

(a) The plant will produce a total of 10,000 pumps per year, in the range mentioned below.

/Table 3.1

Table 3.1

Proposed Manufacturing Programme for Pumps

Item	Machine	Type	Suction branch in inch	Weight per piece kg	Quantity	Total weight kg
1.	NA 2a		2	23	500	11,500
2.	NA 3a		2	26	500	13,000
3.	NN 3a		2½	29	500	14,500
4.	NG 4a		4	85	200	17,000
5.	NL 4		2	58	500	29,000
6.	NA 4		3	82	340	27,880
7.	NN 4		4	85	1,140	96,900
8.	NG 4		5	100	1,350	135,000
9.	NN 5a		5	130	1,250	162,500
10.	ND 5a		8	160	700	112,000
11.	NL 5		3	100	340	34,000
12.	NA 5		4	120	340	40,800
13.	NL 6		4	135	1,140	153,900
14.	NA 6		6	200	1,000	200,000
15.	S 250		10	135	200	27,000
				Total	10,000	1,074,980

(b) The plant in collaboration with Slavia Mapajadla Czechoslovakia will produce 4,300 diesel engines per year as detailed below.

/Table 3.2

Table 3.2

Proposed Manufacturing Programme for Diesel Engines

Item No.	Engine Type	Output HP	Speed r.p.m.	Weight p/piece kg	Quantity	Total weight kg
1.	1S 100 k	9.0	1,500	250	2,250	562,500
2.	2S 100 k	18.0	1,500	335	1,750	586,250
3.	3S 100 k	27.0	1,500	420	300	126,000
				Total	4,300	1,274,750
				Spare parts approx. 7.5%		95,500
				Total		1,370,250

(ii) Plant No. II - Tractor plant

The plant is to produce tractors with Romanian collaboration model U-650 (65 Hp 2-wheel drive), U-S650 (4-wheel drive 65 Hp) and U-450 (2-wheel drive 45 Hp). During early part of the operation 650 and S-650 models will be assembled. The complete project is expected to be in full operation by 1972. It is expected to assemble 5,000 tractors per year upto 1972 and increase to 10,000 tractors/year by 1972-73 onwards.

The total x land area is 25 hectares with additional reserve area. Overall activities are to be in 3 phases.

Phase - I: The first phase consists of construction of assembly shop with 8,800 square meters (with expansion capacity upto 11,000 sq. meters) covered area construction of all other facilities such as Boiler house (600 sq. m), Transformer house (350 sq. m), Training school (1,600 sq.m.), Pump house (1,750 sq. m), water reservoir (450 sq. m), Railway platform (1,100sq. m.)

/water

water treatment plant (2,500 sq. m.), 30 km. of road, offices, houses, and other installation works, etc.

Construction of main assembly shop will be completed by April 1969. All other above construction work is expected to be completed by January 1970. Manufacturing activities of Phase I (1969-70) consists of assembly of 5,000 tractors with 4% local content. Local contents are tyres, tubes, battery, exhaust pipe, filter. All other components will be imported in sub-assemblies. The present consumption of electricity is 20,000 kW/year.

Phase II (1970-72): To manufacture 5,000 tractors per year. By 1972, import content to be 9% such as ball bearings, malleable castings, hydraulic system etc. Out of 91% local content, 13% to be bought from local vendors and 78% to be made in the plant. A foundry, gear shop and heat treatment section will come into operation. Capacity of foundry will be 20,000 tons/year of grey cast iron, 4,000 tons of cast steel/year and forge shop to have 1,000 tons/year capacity. Yearly consumption of scrap iron will be 65,000 tons. The capacity of Furance (electric cupola) to be 5 tons/hour.

Total construction of covered area of 200,000 sq. meter to be completed during the IInd phase.

Phase III: (1972 onwards): The import content to remain at 9%. Production to be increased to 10,000 tractors per year. Total electric consumption at theend of IIIrd phase to be 70 million Kw/year.

B. Machine Building Plant (Agricultural Implements)

Apart from other engineering items, it is proposed to manufacture tractor drawn implements. The investment on the complete plant is about US$45 million

/with

with the US$40 million working capital. The construction is expected to be ready by 1970. The plant may start operating in 1969. It is expected to produce 30,000 tons/year worth of items including 9,000 tons/year worth of implements. Total production target is US$30 million/year. During the first year it is proposed to assemble 35% of targeted total production, and reach 90% of local content in 18 months on a single shift basis and attain targeted capacity by 1972-73.

Total area of the complete plant is 335,000 sq. meters with 37% covered area. When full capacity is reached it will have 2,000 production staff and 800 other staff. The plant will have foundry per steel casting (6,000 t/year), grey iron (2,500 t/yr) and aluminium (600 t/yr).

Tractor drawn implement programme

The implement section of the Machine Building Plant (Arak) is expected to produce the implements detailed in table 3.3.

Table 3.3

Proposed Manufacturing Programme of Tractor Drawn Implements

	Expected Demand 1971-72 (Number)	Weight p/piece Tons	Max. Steel requirement tons
Agricultural Machinery			
1. Integral-mounted three-bottom plough. Working with 1.05 m depth up to 27 cm. Output 0.60 per hour	1300/3000	0.442	1326.0
2. Draw-type three bottom plough working width 0.9 m, depth 25 cm output 0.42 ha/ hour	650/1000	0.660	660.0
3. Integral-mounted disc-type tandem harrow, working width 2m, depth 12cm, output 1.0 ha/hr	1700/4000	0.425	1700.0

/4.

	Expected Demand 1971-72 (Number)	Weight p/piece tons	Max. steel requirement tons
4. Heavy-duty drawn-type disc harrow. Working width 2.6 m, depth up to 20 cm output 14 ha/hour	800/500	1.6	800.0
5. Integral-mounted grain and gross drill. Working width 2.4 m NO. of openers: 16 for grain, 15 for gross. Output 1.56 ha/hr	700/1000	0.698	698.0
6. Semi-integral cotton planter working width 2.4 m. No. of rows 4. Output 0.7 ha/hour	600/1000	0.598	598.0
7. Integral-mounted seed drill cultivator for sugar beet. Working width 2.7 m No. of rows 6. Output 1.6 ha/hour	700/1000	0.665	665.0
8. Integral-mounted cultivator-fertilizer. Working width 2.8 m. Output 2.2 ha/hour	1300/2000	0.646	1292.0
9. Integral-mounted sugar beet lifter. Working width 1.2 m No. of rows uplifted 2. Output 0.37 ha/hour	200/1000	0.155	155.0
10. Integral-mounted ditcher. Furrow cross section depth 35 cm, bottom width 15 cm.	300/1000	0.340	340.0
11. Drawn-type leveller, working width 5.0 m. Output 0.5 ha/hr	300/500	0.679	339.5
Total			8574.0
Spare parts for agricultural machinery			
1. Stepped shafts, weight up to 15 kgs	-	-	70.0
2. Axles, pins, bushes, weight up to 5 kg	-	-	50.0
3. Sprockets, gears, and sprockets, diam. up to 500 mm and modulus up to 6 mm	-	-	50.0
4. Smaller-size body parts and covers, weight up to 10 kgs	-	-	186.0

/5.

	Expected Demand 1971-72 (Number)	Weight p/piece tons	Max. steel requirement tons
5. Parts of strip and sheet steel (shares, mouldboards, discs, etc.) weight up to 15 kg.	-	-	500.0
Total			356.0
Grand total			8930.0 tons/yr

The plant layout and machinery selection is based on the basis that the implements to be manufactured are designs from U.S.S.R. However - as informed - no decision has yet taken place on actual foreign participation. The order of priority of manufacture of different type of implements is not yet known. It has been informed that the price of implements may be 40% more expensive than similar imported ones as the steel is 80% more expensive than international price.

II. Private Sector Projects

In the farm machinery equipment field although there are many small scale manufacturers, there is only one tractor and one power tiller manufacturing plants in Iran.

A) B.M. Volvo Ltd.

There is in collaboration with B.M. Volvo of Sweden. Model BM-400 is locally assembled. About 400 tractors per year are assembled with limited percentage of local content. Sale of tractor is through private dealers set up. Tractors are mostly sold to non-farmers. Sales are mostly on cash basis.

B) Ashtad - Iran Manufacturing Industry Co., Ltd. Teheran

(a) General information: This company is manufacturing power tillers, trailers, implements and threshers. The technical collaboration is with Mitsubi... of Japan with royalty system only. The firm started assembly of power tillers

/in 1962

in 1962 and actual manufacturing programme started in 1967.

(b) Investment and production programme: Total capital is Rials 102 million with revolving capital of Rials 300 million. The investment on machinery is Rials 60 million, on dies and jigs Rials 10 million, and on building Rials 41 million. The total land area is 75,000 sq. meters with plans to add another 82,000 sq. meters at an early date. The covered area is 31,500 sq. meters.

The x total staff is 283 as follows:

Engineers	1
Consultants	4
Technicians	3
Clerks	8
Sales & Service	32
Workers	277

The facilities include foundry, machine shop, painting, fabrication, forging, tool room and inspection. Local machine tools are press up to 40 tons, wood working machinery and spot welding machines.

Salary structuture is relatively high.

For fresh unskilled rials	40-45/day
semi-skilled	80-100/day
operators	200-250/day
Highly skilled	600/day
Engineers 2 yrs experience	35,000/p.m.

The present production capacity is about 3,5000. Tillers per year. The installed capacity is 6,000/yr on single shift basis. Three horsepower ranges in 4 models and manufactured. 60% of price is locally made. Out of

/352 parts

352 parts of power tiller, 105 parts are locally made in 1968. The imported components are bearings, gears, pistons, rings, chains, hardware, malleable castings and transmission parts. Locally made parts are cast iron and aluminium castings, sheet metal components and all fabricated parts including the chasis and frame.

The following is the past manufacturing programme:

Horse power	Units Produced 1966-67	1967-68	1968-69
4.5 kerosine	800	1,200	1,500
7.0 kerosine	70	200	200
7.0 diesel	230	450	950
8.0 diesel	50	90	200
Total	1150	1940	2850

Approximately the production of power tillers with respect to horse power is 4½ Hp (50%), 7 Hp (35%) and 8 Hp (15%).

Sale price of 4½ Hp (K) is Rials 41,000, 7 Hp (K) 54,000, 7 Hp (D) 57,000 and 8 Hp (D) is 60,500.

(i) Tiller trailers (750 kg)

Except for ball bearings and 400 x 16 tyres, all components are locally made. The production is as follows:

1966-67 - 140 units
1967-68 - 200 units
1968-69 - 500 units

Sale price of trailer is Rials 11,000/unit.

(ii) Implements:

Paddy puddling wheels, steel wheels, small plows, levellers and small percentage of rotary tiller is made in the factory. Complete set of implements

/cost

cost Rials 11,000 to 18,000.

(iii) Paddy power thresher:

Two models are manufactured. Except for ball bearings, U-Bolts, springs, washer and other hardware, threshers are locally made out of 124 number of components of threshers, 105 components are made in the factory. The production programme was as follows:

1966-67	-	570 units
1967-68	-	760 "
1968-69	-	1200 "

Sale price of large thresher Rl. 26,000

small thresher Rl. 18,000.

(c) Sales and Service Organization

There are 40 main dealers and 40-50 sub-dealers. Dealers will sell the farm equipment at 1/3 cash down payment and 2/3 in two one yearly installment at 13% interest. There are 13 mobile trucks and 32 people in service section.

(d) Problems faced by local manufacturers

It was expressed that lack of technical personnel, competition from duty free imported power tillers and price difference between locally made and imported farm equipment are some of the difficulties faced by the firm.

C. Proposed plans by New Power Tiller Manufacturers

It has been informed that a well-known farm equipment manufacturer of Japan is expected to enter the manufacturing field with the following manufacturing programme.

/Number

	Number				
	1969	1970	1971	1972	1973
Power tiller	500	700	1000	1200	1500
Rice huller	250	300	300	300	300
Rice thresher	50	100	100	150	150

Table 3.4 gives summary of proposed manufacturing programme and table 3.5 summary of details of manufactuding programme of farm machinery in Iran.

/Table 3.4

Table 3.4

Summary Proposed Manufacturing Programme of Farm Machinery in Teneran

Item No.	Name of Industry	Estimated capacity in operation in 1967	Addition capacity commissioned	Total capacity for operation	Addition capacity under construction
1.	Diesel engines*/	-	-	-	7,450
2.	Centrifugal pumps	3,500	700	4,200	10,000
3.	Deepwell pumps	610	472	1,082	650
4.	Tractor	500	-	500	5,000

	1969			1970		
Item. No.	Additional capacity commissioned	Total capacity in operation	Additional capacity under constn.	Additional capacity commissioned	Total capacity in operation	Additional capacity under constn.
1	2,235	2,235	5,425	118	2,353	5,097
2	3,504	7,704	7,000	5,414	13,118	5,500
3	646	1,723	500	557	2,285	250
4	5,000	5,500	-	-	5,500	-

	1971			1972		
Item. No.	Additional capacity commissioned	Total capacity in operation	Additional capacity under constn.	Additional capacity commissioned	Total capacity in operation	Additional capacity under constn.
1	491	5,588	1,862	1,862	7,450	-
2	9,073	22,191	2,500	5,161	27,352	-
3	1,293	3,578	-	154	4,009	-
4	-	5,500	-	-	5,500	-

*/ Including for industries and other usage.

Table 3.5

Summary of details of manufacturing programme of Farm machinery in Iran

Item	Manufactured by or to be manufactured by	Collaboration with	Model	Specification	Estimated production units per year 1968	1971
1. Agricultural tractors	B.M. Volvo Teheran	a) B.M. Volvo Göteborg Sweden	35 Hp		250	250
	Metallurgical & Engineering Plant, Tabriz (Tractor plant)	b) UZINA Tractoral Bhasov, Rumania	U-650		-	4,000
			U-651			1,000
2. Power tillers	Ashtad-Iran Co., Teheran	a) Mitsubishi Heavy Industries Ltd., Tokyo, Japan	CT-331K5C CT-531K5A CT-531SD5 CT-835D6	5 HP-Petrol 7 HP 7 HP-diesel 8 HP "	3,500	5,000
3. Stationary diesel engine (including industrial usage)	Metallurgical & Engineering Plant-I Tabriz	a) Slavia Napajedla Czechoslovakia	1-S-100K 2-S-100K 3-S-100K	9 HP 18 HP 27 HP		2,250 1,750 300
4. Pumps	-"-	-"-	15 models	2"-10"		10,000
5. Diesel engines	Private company	a) English Electric Co., Ltd. Stafford U.K. (Domin)	2 L-B 2 L-B 5 L-B 6 L-B	24 HP 64 HP 91 HP 230 HP (4 stroke water cooled)		4,000
6. Tractor mounted on drawn agricultural implements	Machine Building Plant Tabriz	Not yet decided (probably USSR)	11 implements	-	-	8,000 t/yr
7. Power tiller implements	Ashtad-Iran Co., Tehran	a) Mitsubishi Heavy Industries Ltd.	Plows, cage wheels etc.	-	-	-
8. Paddy threshers	"	-	-	2 types	1,200	NA
9. Small trailers	"	-	3/4 ton	-	500	NA

2. Other Engineering Industries

Only the following first two factories were visited.

(a) Metallurgical & Engineering Plant - Plant No. I (visited)
(Machine tools, presses, compressors and electric motors)

Various types of drills, lathes, shapes, milling machines, grinding and polishers (total 2,250 Nos. per year). Eccentricpresses (350 nos. per year), stationary and mobile compressors (1,000 nos. per year), different type of single and three phase electric motors (total 5,000/year) are planned to be produced.

(b) Machine Building Plant, Tabriz (visited)

It is proposed to manufacture

(i) General machine building equipment such as cranes, conveyers, elevators, boilers, equipment for sugar and cement mills, welded steel structures, crushing and grinding equipment, water and oiltanks, steel castings for cement and mining industries,etc.

(c) Machine tools

For the present except for presses upto 40 tons capacity, wood working machinds, spot welding and other simple machine tools, no manufacturing facilities exists at the present. The above mentioned two factories are expected to produce the necessary machine tools and equipment.

(d) Fertilizer plants

(i) The production of area in Shiraz Plant is 30,000 tons/year.

(ii) The big petrochemical complex at Shahpur port to manufacture nitrogen is under consideration. The proposed complex is expected to meet the domestic demand and also export nitrogen fertilizers.

/(e)

(d) Steel plants

For the present all steel is imported. The rolling mill at Alahawaz rolls certain sections. Present capacity is 300,000 t/year. Additional 600,000 t/year capacity is expected to be added soon. The large steel plant at Ispahan is expected to come into operation by 1972 and reach full capacity by 1974. It is expected to produce 600,000 t/year at the initial stages and attain 1.2 million tons/year.

3. Ancillary Industries and Raw material

(a) Ancillary and supporting industry

In Iran there are many automobile dealers and mainly are manufacturing plant for Hillman and assemblers and tractor, power tiller and diesel engine assembly is expected to be given a greater emphasis in the near future. According to the Research Center for Industrial and Trade Development, the following will be the assembly of automotive and farm equipment industry during the next three years.

Table 3.6

Estimated Automotive & Farm Machinery Requirements

	Tractor	Power tiller	Diesel/ Engine	Jeeps Cars	Bus Truck	Motor Cycle, ...
Estimated production						
1968	250	3500	-	25,750	7500	300
1971	5000	5000	8300	46,000	23,942	20,000
No. of firms engaged in	3	1	2	7	7	3
No of model to be produced	3	4	8	8	20	8

/For

For the present all the above items are assembled only with imported sub-assemblies or procured in a completely assembled state. Except for tyres, battery, upholstery and other minor items, no local manufacture of components exists.

The items that are normally available from locally manufactured sources are a) Battery b) Tyres and tubes for automobiles c) Nozzle d) Filter e) Leaf springs f) Muffler. There is a limited manufacturing facility available for a) Hydraulic equipment b) Coil springs. However most of the requirement is met by imports. Hence for the present all engine components; electrical parts; axle, transmission and steering assembly compoents, brake, instruments etc. are all imported.

Taking into consideration the above aspects, the Investment Promotion Section of the Research Center for Industrial and Trade Development, Ministry of Economy have made a list of projects for foreign investment in Iran.

Some of the items open and encouraged for foreign investment and participation are:

a) Rubber products - V-belts, rubber sealing etc.

b) Metal products - cutting tools etc.

c) Machinery & parts - portable machines, welding machines, presses, etc.

d) Parts for transport equipment.

(i) Fuses and fuse boxes; (ii) carburators; (iii) crankshaft and camshafts; (iv) gauges and meters; (v) electrical equipment; (vi) brakes and accessories; (vii) engine electrical components; (viii) Fuel injection system; (ix) Fuel, oil and hydraulic pumps; (x) Steering system; (xi) Engine components such as piston etc.;

/(xii)

(xii) clutch and accessories; (xiii) Head lamp etc.

Considering the parts for transport, none is manufactured locally at the present. The custom duty for import is 20% on CIF prices plus 20 rials per kilogram. The required raw material - if component is manufactured locally - is to be imported.

Considering the above components for transport, the estimated domestic consumption for 1968 and 1971 is based on the estimated productionof tranport vehicles, tractors, power tillers and diesel engines. The report by the Investment Promotion Section recommends that the design of the above components should be standardized for all the Iranian products. This aspect requires careful review and feasibility study.

4. Availability of Technical Personnel

(a) Engineering products: University of Teheran is one of the major institutions producing engineering graduates both in the field of Mechanical and Agricultural Engineering. Facilities for higher education is limited. It has been informed that there is a shortage of technical personnel from the industrial point of view in the field of production engineers, Industrial Engineers, Tool Engineers, Design and Development Engineers and also Management Personnel. There is also lack of men in the field of metallurgy, Quality Control, Manufacturing and Planning.

(b) Training facilities for machine operators and industrial skilled Personnel : Excellent facilities exists at the new training school of Machine Building Plant, Tabriz. Training is starting in the field of machine shop practices, wood working and pattern making, foundry, forging, press work,

/heat

heat treatment, inspection, fabrication and tool room.

There are 436 trainees out of which 20 are trained in Czechoslovakia in two shifts. The school has technical assistance from Czecholovakian and is intended to train skilled technical operators for machine building plant only. There are 118 Iranian technicians and 13 Czechoslovakian experts on the staff. The trainees are classified according to three educational qualifications. Trainees are given allowable of Rials 1600 pm for primary school trainees and Rials 2300 PM for high school trainees.

The school expects to provide the technical course for the plant which will have 7,000 employees when fully operating.

This school has excellent facilities to train industrial operators of other plants and also train technicians of neighbouring countries at a later date.

/SECTION IV

SECTION IV

POLICY TOWARDS FARM MECHANIZATION

1. Incentives by the Government:

(a) Import duties: There are no import duties on farm machinery and spare parts.

(b) Protection to local Manufacturers:

(i) No policy is formulated towards protection to be granted to local power tiller industry.

(ii) Normally tractors in horse power range of tract 45-65 which is to be produced by the State Tractor factory is not permitted to be imported except by state run "Institute for Farm Machinery Development".

(iii) Import of implements and other equipment is allowed freely by any agency for the present.

(c) Subsidies:

Direct subsidies to agricultural producers are limited to a fertilizer and a credit subsidy. The credit subsidy in the form of low-cost credit is extended by the Agricultural Bank for seed, tractors, and other equipment, and is aligned with the agrarian reform. This credit subsidy is represented by the amount the bank credit interest rate which is below the bazaar or free market rate.

(d) Crop floor price

(i) Wheat Grade I 6000 rials/ton

Grade II 5200 rials/ton

/Out of

Out of the total production of 3.5 million tons, government in 1967-68 about 215,000 tons.

(ii) Rice Rials 2300/ton

(e) Rural Credit

(i) Institute for Farm Machinery Development for Tractors and Implements:

7.15% down payment, balance 12 half yearly installments for 6 years on 5% interest. Maximum loan on mortgage basis is for 3 tractor and implements and for personal security is for 2 tractors and implements.

(ii) Agricultural Credit Bank:

Maximum loan of rial 300,000 on personal security.

(f) Mechanized units:

The Government operated mechanized units are primarily for land reclaimation. It also hires out tractors to farmers. Certain Irrigation Projects areas such as Saffiabad Irrigation Project, Dezfood convening an area of 22,000 hectares also operates a tractor hiring out service with a fleet of more than 40 tractors.

2. Rural Development

Iran's plans for agricultural development are integrated with the national development policy and executed by the Plan Organization. In the Third Development Plan, Agriculture has received the largest allocation (24.3%) of the toral funds) which will be used for water development and irrigation, agricultural credit, co-operatives, and other means for increasing agricultural production. The Government's new emphasis toward smaller projects and development of the rural sector relate closely to the land reform programme in progress.

/(a) The IV Plan:-

(a) The IV Plan:-

The following are the details of the agricultural sector of the IVth Plan which is expected to start from 1969-70.

Overall agricultural land to ~~gmx~~ go under production will be increased by 455,000 hectares by the end of the Plan period, making the total under cultivation 7.55 million hectares.

The projected increase will be 150,000 hectares in dry farming, and 300,000 hectares in irrigated farming; another 100,000 hectares will be ready for irrigated farming by the end of the Fourth Plan.

The expansion plan calls for an increase in the yeild of rice from 993,000 tons to 1.4 million tons; sugar beet from 2.84 million tons to 3.1 million tons; cotton from 470,000 tons to 600,000 tons; potatoes from 138,000 tons to 438,000 tons; oil seeds from 16,000 tons to 120,000 tons; pulses from 115,000 tons to 170,000 tons; and stock feed from 519,000 tons to 1.52 million tons.

(b) Agricutural Co-operative Union:-

Agricultural one co-operative unions are presently operating in the paddy area of Caspian Sea. Another is expected to be started soon. The present union has 43,000 members. It has an paid up capital of 43 million rials. Each share is 50 rails. The union incoporates three district agricultural co-operative unions, 102 numbers 2 village or town agricultural co-operative societies.

The activities mainly consists of granting credit loans and making available other inputs to the members. The loan is limited to 15,000

/rials

rials per holder member. The interest rate from parent union to district union is at 3%, from district union to village society is at 4% and from village society to the farmer is at 6%. Pay back period is normally 4-6 years.

(c) Joint Stock Agricultural Company for Farmers

This has been started 8 months back by the Ministry of Land Reform for theparticipation of farmers only. It encourages each farmer to pool his land as physical participants and all farm operations are to be carried out on a Joint Stock company basis. It is proposed to select 15 areas per year. For the present the Joint Stock company is operating in one area.

(d) Joint Stock Company - (Newly Developed Areas)

This has been started by Ministry of Power and Water. It is to operate primarily in the new dam areas for cultivation and agro-industries. This will cover the four major dam areas with commanded area of 400,000 ha. which is expected to be completed by 1973. The Joint Stock Company are to be started through private enterprise with Government participation and should provide all facilities not only for crop production, but also for processing industry, in the field of food processing, animal husbandry etc.

The Government is looking for domestic and foreign participants.

(e) Joint Stock Company for Fertilizer Distribution

This is primarily to import and distribute both domestic and imported fertilizers. It handles about 170,000 tons/year and private agencies handle about 70,000 tons/year. The price of area to the farmer is about rials 8.5/kg.

3. Research, Testing and Educational Institutions

(a) Research and Testing

Agricultural Engineering Institutions and Department of Agriculture is engaged in research. Integrated programme of research, testing and extension is carried out by the Machinery Research Division of the Agricultural Engineering Research Center, Karaj. The center is engaged in training and research. Training is in the field of Agricultural Engineering to farmer and tractor drivers (50 number/year) mechanics (25 numbers/year), and university students (20 numbers/year). Research is in the field of Agricultural machinery and irrigational systems with a staff of 6 engineers. The farm machinery research division is primarily engaged in research and testing in the following fields:

(i) Testing: - Rumanian tractors model 650 with Perkins engine, model S-650 (crawler) and Hungarian Dutra tractor, Disc Harrow, pull type combine and mid mounted mower.

(ii) Modification of Designs

(iii) Recommending Manufactury Program

The Division has a laboratory for testing of draft, fuel injectinnsystem, fuel consumption and other factors. The Division need of technical personnel assistance and modern testing equipment.

(b) Agriculture and Agricultrual Engineering Education

(i) Agricultural college Shiraz:

Provides five years course, first two years in general agricultural subjects and 3 years with emphasis on farm power and machinery leading to B.s degree in agriculture.

/(ii)

(ii) Agricultural College, University of Teheran, Karaj:

A 5 year study in agricultural engineering a few High School is provided leading to Bsc. Engineering degree.

(iii) Karaj Farm Machinery and Soil Conservation Training Center:

The center was established in 1960 by CENTO. Groups of 30 agricultural engineers participants nominated by Iran, Turkey and Pakistan attend the center for a 12 months course of study at college level. Center has 200 ha. farm, and a well equipped farm machinery workshop.

(iv) Agricultural High School, Karaj:

Two year agricultural course includes tractor driving and farm machinery operation and maintenance.

4. Training and Extension Service

(a) Machanics and Tractor Drivers Training Center (Karaj).

This is run by the Agricultural Engineering Section of the Department of Agriculture. It provides 10 months course to 30 students per year in tractor operation and service; four months short course to participants nominated by the farmers co-operatives; two month short course in provinces to farmers.

(b) Agricultural Extension Scheme

A 12 month training is provided to High School graudates in extension work, which covers farm machinery operation and maintenance.

/SECTION V

SECTION V

POLICY TOWARDS INDUSTRIALIZATION

1. General Trend of Economy: -

According to 1966, gross national product was US$6.4 billion of which 45% was contributed by agriculture and 18% by manufacturing. The 3rd five year plan has been successfully implemented. The market has been growing at an accelerated rate from the past few years. The G.N.P. at constant prices increased by 8.5% in 1966-67, and during 1962-67 period, the same increased by average 6.4% per year. There has been many activities in the ~~xxxx~~ field of industrialization from the past few years. Plans have been finalised in the field of fertilizer and petrochemical complex ($170 millions) apart from many other industrial ventures.

In general the general trend of economy of Iran is stable and progressive.

2. Incentives for Investment:-

1. Government encourages foreign investment. There is no requirement for equity participation by Iranians, although government prefers joint ventures.
2. Normally investment in all fields except oil, tobacco and cigarette are open for foreign private participation. State enterprises are engaged in machine building, tractor manufacture and metallurgical and engineering manufacture. Normally, the policy of the government is not/to enter manufacturing activities except steel, aluminium and petrochemicals.

/List

List of projects for foreign investment in Iran is published by the Investment Promotion Section of the Research Centre. for Industrial and Trade Development (Ministry of Economy).

3. The government controls on investment, local content requirements, mandatory membership, establishment of company are fairly liberal and prices control on engineering manufacture goods do not exist. The laws regarding royalty, remittability of ~~sm~~ funds repatriation of funds are favourable for foreign investment. The tax structure is fairly liberal.

4. Tax incentives for progessively locally manufacturing industries, exemption of custom duties on imported machinery and spare parts for negotiated periods (usually 10 years) for new investments are provided.

5. Although it is said that money is usually tight in Iran for investment, short term credit for working capital is available from commercial banks, the largest being the government owned Bank Melli Iran. The interest rate about 8-12% for good investment. Medium and long-term loans are obtainable from privately owned Industrial and Mining Bank of Iran for a period 2-10 years at an interest rate of 7 to 8% and Industrial Credit Bank which grants 3-10 year loans to finance small industries and also for working capital.

6. Information on investment is provided by the centrer for the attraction and protection for foreign investment in Iran, Bank Markazi Iran, Tehran.

3. International Cooperation

Iran is actively participating in International Cooperation Programmes. Links between Iran, Pakistan and Turkey has been growing since Regional Cooperation for Development was set up in 1964. There is cooperation in the field of farm mechanization also.

There is scope for more international cooperation in the field of training of industrial operators. Farm machinery, research, development and testing and exploring the export potential for tractors and implements to be manufactured in Iran. Active participation opportunities also exists in the field of agricultural engineering education and extension.

/SECTION VI

SECTION VI

GENERAL CONCLUSIONS

1. At present only 6.85 million 6r 4.2% of total area is under effective cultivation. Another 15.6 million acres are potentially capable of being brought under cultivation without too much cost.

2. The role of private tractor dealer organizations is limited due to import restriction on tractors of 35-80 Hp. It may be necessary to include the existing dealers in the overall net work of the state run Institute for farm machinery development.

3. There are good market demand for tractors, engines, pumps, sprayers, dusters, threshers, hullers, cleaners, combine harvesters and sugar beet harvesters.

4. There are good scope for local manufacture of power tillers, deep well pum centrifugal pumps, hand pumps, hand sprayers, power sprayers, combine harvesters, threshers, seed cleaners and tractors drawn implements.

5. Although the state tractor plant will be producing both 65 Hp 4 wheel drive and 2 wheel drive, it may be necessary to realistically examine the ultimate cost structure of both models when locally manufactured as the small price difference in the imported tractor models may not truly reflect the probable price difference when manufactured locally.

6. There is a necessity to re-examine the implement programme of the state factory and plan on selective priority order.

7. It is necessary that more encouragement may be given to local manufacture of ~~from~~ power tillers and small implements for paddy cultivate.

/8.

8. Production of combines could be considered in the future in collaboration with neighbouring countries.

9. The existing ancillary and supporting industtiea are only a few. It is necessary to encourage investment. The existing line of thinking that design of all automotive and tractor ancillary products listed by the investment promotion section should be standard for all Iranian Products is to be re-examined in the light of its practicability.

10. There is a necessity to reinforce agricultural engineering education.

11. More facilities are necessary to train farm machinery operators and mechanics.

12. Rural credit system is to be expanded.

13. There is a great necessity to reinforce the research and testing facilities and technical personnel of the machinery research division of the Agricultural Engineering Research Centre, Karaj.

14. The Industrial Operator Training School at Tabriz (Machine Building Plant) has excellent facilities and the possibilities of training operators from neighbouring countries may be explored.

/APPENDIX - A

APPENDIX - A

Reference - Literature

1. Year Book-Foreign Trade Statistics of Iran, Ministry of Finance, Bureau of Statistics.
2. List of Projects for Foreign Investment in Iran. Investment Promotion Section. Research Center for Industrial and Trade Development. Ministry of Economy.
3. Agricultural Policies of foreign governments March 1964. Economic Research Service, United States Department of Agriculture.
4. The Africa and West Asia Agricultural Situation 1964. U.S. Department and Agriculture Economic Research Service.

APPENDIX B

Persons and Organizations Visited

1. United Nations Development Programme for Iran

   12, Khiaban Bandar Pahlavi
   Off Takhte Jamshid
   P.O. Box 155, Tehran.

   a) Mr. Edouard J. Collin - Resident Representative
   b) Mr. Halbert - Deputy Representative
   c) Mr. Bernander

2. Ministry of Economy (Research Centre for Industrial and Trade Development)

   Arg Square. Govt. of Iran, Tehran

   a) Mr. Vafa - Deputy Managing Director (IMCI & TD)
   b) Mr. Hassan Bahar - (Counterpart to the team)
      Head of Projects Committee
   c) Mr. Cyrus Showghi - Research Center for Industrial & Trade Development, Committee for Drafting & Evaluation of Projects.

3. Ishtad - Iran Manufacturing Industrial Co. Ltd.

   H. O Vesale Shirazi Avenue
   Ashtad Building, Tehran
   (Manufacturers of Mitsubisi Power Tillers)

   a) Mr. B.S. Aidun - Managing Director
   b) Mr. K.R. Aidun - Managing Director
   c) Mr. F. Fazai
   d) Mr. T. Okvi - Production Manager, Agricultural Machinery Department.

4. Arak Machine Building Plant, Tehran (Plant at Tabriz)

   a) Mr. Dagusta - Managing Director
   b) Mr. R.G. da Costa - Project Manager
      Managing Director
   c) Mr. F.R. Moasser - Plant Manager

/5.

5. Ministry of Agriculture (Tehran)

   a) Mr. Amir Parviz - Deputy Minister for Agriculture

6. Metallurgical & Engineering Plant

   (Machine Building Plant), Tabriz

   a) Mr. Tughi Taraholi - General Director (Machine Building)

   b) Mr. Parook - In-charge, Training School

7. Tractor Plant, Tabriz

   a) Mr. Iravani - Field Manager

8. Tractor Sales Shop, Tabriz

   (Dealer for Universal Tractor)

   a) Mr. Orumchian - Managing Director

9. Agricultural Engineering Research Centre, Karaj

   a) Mr. Teherani Teherani - Head of the Centre

   b) Mr. R. Kaimizadeh - Head of Farm Machinery Research Centre

10. Iseki Agricultural Machinery MFG Co.

    c/o Mitsui and Co. Ltd.
    P.O. Box 828 Tehran

    a) Mr. F. Ide - Resident Representative in Iran

    b) Mr. K. Mori - Permanent Resient Representative in Iran.

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