CHAPTER III

AGRICULTURAL DEVELOPMENT AND ITS POTENTIALS
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A. Role Of Agriculture In The Economic Development:

In the recent years, the vital role of agriculture in earlier stages of economic development has received considerable emphasis by a large number of economists. Most of the western economists are of the view that in the strategy of economic development of a developing country priority should be given to agriculture. Bauer and Yamey have emphasized the general characteristics of agriculture in today's underdeveloped countries and have drawn attention to the important role agriculture could play in the growth process. The agricultural sector served in various roles. It provides livelihood to a large part of urban population. It supplied a market for manufactured goods and is also a source of capital for industry. It can provide the government with substantial sources of revenues from cash crops. The two economists remark paradoxically, that the best way to industrialisation in any country is to use more rather than less of its resources to encourage the enlargement of agricultural output and the improvements of agricultural techniques. The main reason which is advanced in favour of this statement is that the most of the industrialised countries of today were once predominantly agricultural and that expanding agriculture formed the basis for the subsequent establishment and expansion of manufacturing.¹

¹ Bauer & Yamey, op.,cit. pp. 235-236
The general feeling is however that agriculture and industry are interdependent, and growth in one cannot proceed far while the other stagnates. A balanced effort is needed. Another important reason of the agriculture's importance in the national economic development of an underdeveloped country is its sheer dominance. In most of the less developed nations it is a major industry and a major source of livelihood in the early years of development. Libya is no exception.

Planning for agricultural development in underdeveloped country is not a simple task. It requires long-term programmes, heavy capital investments, and institutional reforms. These efforts can be classified into three general categories: (1) Capital expenditure, (2) institutional reforms, and (3) other protective measures.

Agricultural development in most of the underdeveloped countries requires heavy capital expenditure to increase the agricultural productivity through better use of resources. Large-scale irrigation projects are needed to bring the necessary water to farm lands. Other agricultural projects in land erosion, prevention, afforestation, and so on are necessary to improve the climate and soil. General agricultural diseases must be fought and eradicated to protect the existing production and cultivators interest. All these programmes require capital expenditure that are often too great for private cultivators and the government should take the responsibility. But from the Libyan experience especially in the late 1970's we find that it is not only capital expenditure that is necessary for agricultural development. The Libyan government
have spent a lot of money on this sector but it failed to achieve any substantial increase in the production. The reason is the ineffective use of resources especially water which is so precarious and at the same time very important for agricultural development in Libya.

It is found from the experience of many middle-eastern countries that proper agrarian reforms can improve the condition in the agricultural productivity. Egypt, Syria, Algeria and Iraq are some of the examples where productivity has increased through land reforms. In Libya only limited measures are undertaken and a more serious effort is needed.2

Institutional reforms are essential for agricultural development as it brings self improvements in the agricultural sector. The following are the most important measures necessary for the basic agricultural development in Libya:

1. Small cultivators must be aided financially and technologically in order to begin and expand their production.
2. Better seeds and more suitable methods of cultivation must be introduced in order to improve the quality and quantity of farm production.
3. Extensive community development programmes and the stimulation of their participation in the process of agricultural development is needed.
4. Rural and vocational schools in various fields such as dairying, poultry raising, fruit drying, bee keeping, livestock breeding, and farm management must be established to improve the cultivator's technical and physical ability.

2. Yusif A. Sayigh, op.cit. 1978 p. 53
5. The element of risk in farm production, caused by the traditional inelasticity in agricultural output with respect to price changes, must be reduced through certain price subsidies and crop diversification.

All these measures are undertaken by the Libyan government for the agricultural development of the country. Plans for agricultural development undertaken by the Libyan government are divided into two broad categories. First the physical reforms which include plans for irrigation and afforestation intended to raise productivity through better utilisation of its available resources. Secondly there are plans which are intended to bring about the necessary structural reforms. These plans seem to improve the cultivator's incentives and productivity through such measures as land reforms or community development projects.

Before going into details of these plans and their achievements it will be useful to introduce the major economic and geographical features relevant to agricultural development.\(^3\)

### Weather And Climate:

The four principal weather phenomena, the variation in which affect the viability of plant-life in climatically marginal environments, are precipitation, heat, humidity, and wind. By far the most important of these in Libya is precipitation. Libya enjoys two seasons each year, one warm and the other cool. The warm season is a dry season.

**Rainfall**: Rainfall throughout Libya is erratic and scanty, and it also varies from year to year in quantity and distribution. The rainfall is

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largely, if not entirely, caused by the cyclonic depressions which invades the Mediterranean basin in winter from west to east. Broadly, speaking rainfall is most abundant in the western regions and nearer the sea, and it varies in inverse proportion to the distance from the coast to the interior, as well as from west to the east. However, the highlands are the exceptions. Here the increase in rainfall is explained by the altitude. Thus Cyrenaica has markedly less rain than Tripolitania, and the northern part of Libya more than in the rest of the country. Jabal-El-Akhdar has the highest amount of rainfall in Libya (about 20.7 inches annually). The traditional zones between the northern belt and the desert have a periodic precipitation, a season of fair, though limited, rainfall during which steppe vegetation bursts into life and the water table is replenished.

In the desert region, the rainfall is episodic, coming largely in winter at irregular intervals and invariably as cloud bursts. The annual rainfall here is five inches. Almost the entire annual precipitation may come in a single pour, lasting a few moments. So much water falls so quickly that little can penetrate the soil, and is evaporated by the Sun. In general, the rainfall of Libya averages 6 to 12 inches annually.

**Temperature:** The temperature of Libya is generally affected by the following factors.


1. **The Mediterranean Sea:** The presence of the Mediterranean sea of northern Libya has a great effect on the temperature conditions during different seasons. The Mediterranean sea is notable for its warmth;
during the winter season, the sea's influence reduces the severity of cold on the coastal strip. In the summer season, in spite of the warmth of the Mediterranean, its temperature is relatively less than that of the neighboring areas; hence it moderates the high temperature of the coastal strip.

**Winds:**

The most important winds which affect the temperature are, the northeasterly trades, the Ghibli winds, and the northern cold winds.

**Northeasterly trades:** These winds prevail over the entire northern part of Libya during summer. They make mild by moderating the hot temperature on the coast.

**The Ghibli Winds:** These are local winds blowing from the desert during spring and early summer, and also during autumn. It caused an abrupt rise in temperature and a striking decrease of the humidity, bringing with them a sultry heat and dust storms from the heart of Sahara desert.

**The Northern Cold Winds:** These winds blow during winter and, to a certain extent, in spring and autumn at the front or at the rear of the cyclonic depression which invade the Mediterranean basin from west to east, passing over the northern part of the country and causing a temperature decrease and precipitation. The northern winds sometimes bring air which cause severe cold waves to invade the northern part of Libya, resulting in a sharp drop in temperature to the freezing point. These cold waves last from one to ten days, depending on the duration of depression cells over the Mediterranean basin.

**Relief:** The temperature differs from the highlands to the low lands, according to the general formula of the lapse rate. And it is found
that the temperature of some stations in the mountains, both in Tripolitania and in Cyrenaica, differ from other stations lying in the adjacent areas. For instance, in Tripolitania, the temperature of the hottest month (August) at Bir El Ghnam about 145.4 meters or (469 feet above the sea level) is 85.8°F, while at Gharian about 725 meters or (2,378 feet elevation) in the same month, it is only 79.2°F. In Cyrenaica, at sloppy about 61 meters or (200 feet elevation), the temperature in August is 79.2°F, while the Shah-Hat approximately 61 meters or (2,005 elevation), it is only 72°F.

Geographical Position: Libya lies approximately between latitudes 18° and 35°N. Despite the fact that a considerable part of the country is located in the middle latitude it is subjected to the desert's influence because of its location at the northern edge of the Sahara desert. The effect of the desert is apparent in the general distribution of the precipitation and temperature. In the drought years, especially if they come in two or three successive years, the desert influence encroaches so strongly that the country is almost entirely dominated by the desert climate. In the rainy years, the opposite to a certain extent occurs.

Drainage and Underground Water: There are no perennial water courses in Libya which may properly be called rivers. The wadis are dry river beds, sometimes several hundreded miles in length, and of considerable breadth. When these wadis are favoured by the erratic rainfall, vegetation bursts into life and the water table is replenished. Then the subterranean deposits are created which can be used for irrigation or drinking purposes and whose water is obtained in most sections by digging or drilling.
wells of varying depths, while in other sections the water flows through natural springs usually found in the wadi floors. There are no lakes except the Sabkhat Tawarqha or the small marsh, deep water lakes of the Kufra and Fezzan oases. Hence the source of the surface and underground water is completely dependent on the winter rainfall.

Soils:

The soil of Libya lies almost entirely within the pedocal soil groups. But local soils vary from place to place according to their physical characteristics, particularly with regard to their moisture holding capacity and their fertility. The soils of Libya are rarely clayey, but generally calcareous or silico-calcareous and poor in humus. Because of the Mediterranean type of climate with scanty rainfall and dry hot summers; the vegetation is restricted in the country. Reddish soils (hamra earth or terra rossa) are found frequently on Jabal El Akhdar in Cyrenaica.

Along the coast of Tripolitania, soils are predominantly light and sandy and usually do not contain stones or light gravel. The clay content is between 1 and 5 per cent. The lime content of Libyan soils in general varies considerably from less than one per cent and more than 50 per cent. Soil thickness ranges between 10 meters and 20 meters. Classified as pedocalic regosols, these immature soils are loose, friable and permeable and contain free calcium carbonate both as fragments and small nodules. Unless protected by a vegetative cover, these soils are very susceptible to wind action. Shifting and fixed sand dunes occur along part of Tripolitania coastal strip and in the Jefara Plain. These sand
The sand dunes are comprised of two types of sands; marine sands on the coast line, and continental (acolian) sand on the Jefara plain. Different combinations of these two types give rise to many varieties of intermediate soils. The sand dunes are a big problem facing the Libyan authorities because of their encroachment on the agricultural areas.

The soils of interior plains (Jefara Plain) of Tripolitania is a compound of various types, with no sharp line discriminating them from those of the coastal strip. Cemented and crusted soils are found in the vicinity of Tripoli. A substantial area in the arid part of the western Jefara Plain is covered with a calcareous crust. Here the weather is very hot and rainfall is less than six inches annually, the land is not suitable for cultivation and is of little use for grazing.

In the interior of Jefara Plain, some very limited alluvial materials occur in the valley floors, having been carried by intermittent wadis (valleys) which flow from the cretaceous bed of Jabal Tarablus to the Jefara Plain. Some of these wadis have succeeded in reaching the sea and have carried their alluvial materials to a larger area in the north; Wadi El Mjenin is the most famous of these. Most of the other wadis sink into the plain, a short distance from their source. The most fertile soils of Tripolitania are those which originated from the alluvium of Wadi El Mjenin and which derived from the cretaceous beds of Jabal Tarablus.

Another extensive type of soil occurs near the base of the Jabal Tarablus escarpment. These alluvial soils are similar to those of the Jefara Plain, except that they generally are considered more gravelly.
and are also developed into series of long narrow gravel ridges which form the southern border of the interior Jefara Plain. Alluvial fans are found in this area and their soils consists of stony materials and gravels brought down when the adjacent wadis flowed with tremendous amount of water. Another important characteristic of the soil of Tripolitania, and also of the southern oases, is their tendency to be easily affected by wind and water erosion. In many cases soils are not suitable for agriculture. Tripolitania contain far less of the chemical elements necessary for plant nutrition than do the soils of Cyrenaica.

To sum up the soil of Libya is not uniform; the soils of three regions differ considerably. The soils of Cyrenaica is mostly the residual product of weathering and decomposition of the parent rock materials. The soil has a high clay content, considerable potash, and also contain some phosphorus and nitrogen. The soil here is quite calcareous with a subalkaline reaction. In Tripolitania most of the soils are loose, and contain few colloid substances. The soil of Fezzan oases is nearly very light and lack humus. In the Wadi Esh Shati area, the soil is clayey and is covered with a gypsum salin crust.

The Position Of Agriculture In Libya In The Pre-revolutionary Period: (1951-1969)

This period can be divided into two, one is since independence to 1960 that is when the economy was based on the foreign aid and second since the discovery of oil till the revolution, that is from 1961 to 1969.
Agriculture In The Early Years Of Independence (1951-1960)

Until 1960 when the oil industry started to exert an influence, the Libyan economy was based almost on agriculture. Ground nuts, olives oil, livestock hides and skins, almonds, castor seeds and esparto grass were important export commodities in the trade with other countries during the pre-oil period. At that time because of its natural environments and lack of commercial natural resources for the development of important industries, agriculture was the main occupation of Libyan people.

Libya's total land area was estimated in 1951 at about 434,596,500 acres, of which only five million consists of arable land and land under cultivated crops, and more than two million acres are forested. There was about 24 million acres of productive land in Tripolitania, of which some 19.6 million was suited for grazing. The actual area under irrigation and cultivation was about 247,114 acres, most of which is situated along the coastal strip and on the Jefara Plain and also in several sites on the northern edge of Jabal Tarabulus. Cyrenaica has about 9.9 million acres, of which 8.9 million acres suited for only grazing and shifting cereal cultivation and about 428,000 acres was covered with forests.4

It was estimated by the IBRD mission report in the early 1960's that out of the total land area of 1,760,000 square kilometers only 5 to 10 per cent can be put to economic use and not more than one per cent is suitable for settled cultivation. Generally land use in Libya is

is divided into three categories:
(1) land under settled farming, (2) grazing land and (3) land under shifting cultivation.

The system of land cultivation was based on either verbal or written contracts between landlord and tenant and get their share according to the contract in which a smaller share goes to the farmer. The Libyan farmers were poor using primitive tools and methods of cultivation, grow poor quality of products mainly cereals, fruits and vegetables for which they got very small amount through marchants.

According to the IBRD report the system of irrigation was very primitive. The traditional system of irrigation in Libya was to lead the water from the wells to small plots called gedula, generally of about two or three meters. Each plot was surrounded by a low earth bank to hold water in it until it disappears by infiltration and evaporation. When the ground water table is high as in most coastal fringes areas, this method of irrigation had the disadvantage of inducing the precipitation and the concentration of any salt in the water, with the result that increasing amount of water is lost through evaporation. In contrast there were few modern farms run by the Italians where capital, ability and technical knowhow was available. In Tripolitania and Cyrenaica there were a number of large commercial farms employing hired labour, equipped with tractors and other machinery and irrigation facilities.

Further it was pointed out by the aforesaid report that the most serious physical difficulties faced by the Libyan agriculture is the shortage of water and the erosion of the soil. Other important difficul-
ties faced by the Libyan agriculture were the tribal ownership of land, inadequate supply of credit to small farmers, lack of knowledge of modern farming, lack of marketing facilities and absence of any government organisation. The only source from which the average small farmers can get credit was usually from the local merchants to whom they used to sell their crops. This was an odd transaction and the farmers had to pay a high price for it and a very little price for his crop.

The mission believed that a concerted effort by the government can improve the conditions of the farmers. Several recommendations were put forward to improve the conditions of the farmers by the IBRD mission. Only few of them were adopted by the Libyan government, e.g. the government guaranteed the farmers to buy its surplus produce and storing facilities were provided. The National Bank Of Agriculture (1957) encouraged the small farmers by giving them loans to buy the farms owned by the emigrating Italians. Also the government had given the farmers an additional boost by creating Agricultural Co-operative Societies all over the country. These societies in the latter years played an important role in the development of agriculture and protect the small farmers from being exploited by the capitalists. The IBRD mission also proposed a total expenditure of £ 5,130,000 for five years 1960/61-1964/65. In the first ten years of independence i.e. 1951-1961, public expenditure on agriculture and irrigation had increased almost ten times. It increased from 321,000 LP in 1952/53 to 2,165,000 LP in 1956/57, for the three successive years it dropped to 2,000,000 but again increased to 2,824,000 LP in 1961/62.

Position Of Agriculture In 1960's And The Impact Of Oil On The Libyan Agriculture

The development of oil industry in Libya had a profound effect on its traditional pattern of the economy. This industry provided an important stimulus to the nation's income and changed the economic pattern primarily by providing a large flow of foreign exchange giving Libya an extraordinary capacity for foreign payments. The economic structure of the country was drastically changed in a relatively short period of time. The oil industry had increased both total and per capita income. But this discovery and sudden upsurge of oil output and revenues coincided with stagnation and even decline in agricultural sector. In Libya in a decade 1958-68, GDP increased five fold, while the value of agricultural output rose by only 20 per cent.  

During the same period there was a large increase in imports of consumer goods particularly of food products to meet the local demand. The value of food imports which was £L 5,800,000 in 1959 increased to roughly to £L 27,608,000 in 1968. The total value of food exports on the other hand dropped from about £L 1,000,000 in 1959 to about £L 32,000 in 1968. The main reason for the decline in Libya's food exports and the rise in food imports, are the constant increase in the per capita consumption due to increased purchasing power, and the decline in the domestic production of foodstuffs. The migration of people from rural to urban areas was a great setback to the agriculture. People migrated from rural to urban areas to find more lucrative employment there in the oil sector. As a result of this negligence, the top fertile soil of land

was carried away by wind and water.

In real terms, the distribution of income was such that certain section of the population especially farmers and nomads received relatively slight improvements. For instance after the discovery of oil the total expenditure on agriculture and irrigation for the years 1961-63 increased from 2,824 to 3,086 thousands of LP and in the First Five Year Plan 1963-68 a total of 29,275,000 LP was allocated to the development of agriculture. Despite this increased size of the allocation for agriculture, The Economist of London observed, "agriculture in Libya could well observe the whole 16½ million pounds without showing much immediate returns." The low production coupled with the fact that about 70 per cent of the population was engaged in agricultural sector reflects the significant feature of Libyan agriculture—its subsistence nature. Thus we conclude that in this period the renewable resources—soil, water and natural vegetation was degraded instead of improving due to the negligence of this sector by the people and the government of Libya.

Agricultural Development After The First September Revolution 1969-80

Since development is much to do with increase in productivity, the First September revolution has accorded a high priority to agricultural development. Both in the form of horizontal and vertical expansion, with the major aim of attaining self-sufficiency targets in the essential food products in the shortest possible time. Development in this phase is different from the first two in that it presents a different experiment

with socialist modes of production and distribution promoted within the Islamic framework. These efforts have been greatly facilitated by the discovery of vast underground water reserves at Kufra which has widened the scope for irrigation and improve crop yields.

The leading part of the agricultural programme is based on the five main schemes of integrated agricultural development located in: (1) The Jefara Plain near Tripoli; (2) Jebal Akhdar near Benghazi; (3) The Fezzan in the south west; (4) Kufra Sarir and (5) Sulul-El-Khudr in the central coastal area. All these schemes mainly consist of reclamation and cultivation of land and the application of the integral agricultural development on these areas. Following is a bare outline of the various achievements of agricultural sector during the revolutionary government.

The first phase in the green revolution 1973-75 accomplished an increase in the production of some of the main food items like wheat, barley, vegetables, dairy products, meat and honey. The following table on the next page shows the quantitative gains in agricultural production since the revolution. From the table it is clear that in the agricultural sector both crops and animal production have made pronounced gain between the period 1969-70 to 1975-76. There is an increase of about two or three times for most of the agricultural products. By 1976 the total area reclaimed was 578.3 thousand hectares. This task of reclamation is entrusted to two major public agencies, namely the Secretariate of Agriculture and Agrarian Reforms, and the Secretariate of Land Reclamation and Development. The above mentioned land reclamation programme

was accompanied by the necessary complementary development of agricultural roads, farms, houses, and training programmes for farmers. A total number of 5443 houses were built, 7346 kilometers of roads were constructed, 6066 farms were allotted to the farmers and 13119 farmers were given training.

TABLE No: I

Evolution Of The Agricultural Production Achieved Up To 1976 (thousand tonnes)

<table>
<thead>
<tr>
<th>Crops</th>
<th>Average Production for 1969-70</th>
<th>Production for 1976</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>49.8</td>
<td>130.0</td>
</tr>
<tr>
<td>Barley</td>
<td>88.4</td>
<td>196.6</td>
</tr>
<tr>
<td>Fruits</td>
<td>90.3</td>
<td>136.9</td>
</tr>
<tr>
<td>Vegetables</td>
<td>201.0</td>
<td>652.2</td>
</tr>
<tr>
<td>Legumes &amp; oil seeds</td>
<td>12.8</td>
<td>23.0</td>
</tr>
<tr>
<td>Olives</td>
<td>52.1</td>
<td>155.1</td>
</tr>
<tr>
<td>Meat</td>
<td>42.3</td>
<td>50.3</td>
</tr>
<tr>
<td>Dairy</td>
<td>51.1</td>
<td>85.0</td>
</tr>
<tr>
<td>Eggs (millions)</td>
<td>53.1</td>
<td>82.4</td>
</tr>
<tr>
<td>Honey (toms)</td>
<td>30.0</td>
<td>242.0</td>
</tr>
</tbody>
</table>


In the field of grain storage which is an essential link in the self-sufficiency programme—a total bulk of storage capacity of 80,000 tonnes was completed by 1976 in the form of grain silos. 10

The volume of agricultural credit extended to the farmers went to LD 67.5 million during the period 1970-76, from the low level of LD 16

10. Ibid., p. 19.
million extended in the preceding five year's period. Also number of farmers benefitting from these loans went up from 58 thousand to 175 thousand between the two respective periods. The number of agricultural loans and the amount paid out by the agricultural bank also increased since 1967. The number increased from 11964 to 17018 during 1967-76 and the amount increased from 3094,000 LD to 6815,000 LD during the same period. Coupled with this was the growth in farm subsidies, of which LD 75 million were made available to 221000 farmers during the period 1970-76. The number of co-operative societies which established in 1957, increased from 41 in 1970 to 220 in 1976. Another accomplishment of the agricultural sector during the revolutionary period is the growth of domestic animal wealth. This is summerised in the following table 2.

<table>
<thead>
<tr>
<th>Livestock Category</th>
<th>Units</th>
<th>Additions made up to 1977</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheep</td>
<td>Thousands</td>
<td>204</td>
</tr>
<tr>
<td>Cattle</td>
<td>&quot;</td>
<td>13.5</td>
</tr>
<tr>
<td>Camels</td>
<td>&quot;</td>
<td>1.5</td>
</tr>
<tr>
<td>Bee Hives</td>
<td>MILLIONS</td>
<td>18.8</td>
</tr>
<tr>
<td>Chickens</td>
<td>&quot;</td>
<td>6.8</td>
</tr>
</tbody>
</table>


11. Ibid., p. 19

The Second Five Year Plan was more concerned with development, diversification, and reclamation. In 1976-80, during the second five year plan a sum of LD 1.6 bn out of total investment of LD 7.5 billion was devoted to agricultural and integrated agricultural development, land reclamation, stock rearing, irrigation mechanisation, training and subsidies. But unfortunately the set target of this plan was not achieved. It is admitted by the Libyan authorities that certain shortfalls were carried over in this plan. In 1980, about 75 per cent of the food requirements were imported at high cost; and a large amount of LD 3 million out of the total investment of LD 18.5 million has been earmarked for agricultural development under the current Five Year Plan (1981-1985).

From the following table number 3 we can see the fact that in the Second Plan the production of agricultural products like olives, barley etc remained almost the same.

TABLE No.3

Output Of The Selected Agricultural Products

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Olives</td>
<td>99</td>
<td>100</td>
<td>165</td>
<td>100</td>
</tr>
<tr>
<td>Olive Oil</td>
<td>19</td>
<td>21</td>
<td>26</td>
<td>19</td>
</tr>
<tr>
<td>Barley</td>
<td>196</td>
<td>200</td>
<td>196</td>
<td>200</td>
</tr>
<tr>
<td>Tomatoes</td>
<td>208</td>
<td>215</td>
<td>220</td>
<td>232</td>
</tr>
<tr>
<td>Onions</td>
<td>40</td>
<td>57</td>
<td>57</td>
<td>59</td>
</tr>
<tr>
<td>Dates</td>
<td>62</td>
<td>82</td>
<td>70</td>
<td>80</td>
</tr>
</tbody>
</table>


Total agricultural production however increased by 14 per cent in 1980 compared to an average of 7 per cent from 1975 to 1979. It is estimated that despite a huge expenditure (of about $4 billion) on agricultural development between 1975-1980, growth in agricultural sector is less than the growth in manufacturing and other sectors. Much of the $4 billion is spent in large projects that will take time to come into production.

The changing position of agriculture is reflected in the changing pattern of the industrial structure of the country. From the available estimates we come to know that the percentage contribution of agriculture to the GDP declined over the period 1962-1980. The contribution declined from 9 per cent in 1962 to 5 per cent in 1965, 3 per cent in 1969, 2.2 per cent in 1975, and dropped to 1.9 per cent in 1980. The agricultural sector have moved back to lowest position in regard to the relative contribution to GDP. The population of Libya is nearly doubled during 1951-81, from one million to 2.5 million, with an addition of 300,000 foreign workers. The food requirements are increasing while the agricultural production is not increasing at the same rate. However Libya is not likely to face the severe food crises as long as there is extraordinary capacity to import the food. But in the long run some critical food problem may develop if Libya's agricultural potential lag too far behind its need, especially when the high value oil exports will be exhausted.

The primary problems of the Libyan agriculture are lack of suitable land for cultivation, lack of irrigation facilities and shortage of labour. About 13 per cent of the workers in this sector are non-Libyans. In Libya rainfall is minimal, water resources limited, the soils are poor, the thin vegetation area cover degraded and vast area consists of desert—94.6 per cent of the total area of 176 million hectares is described as 'wasteland'. In 1981 only 1.4 per cent area was arable and 0.1 per cent is irrigated. This achievement is very little in comparison to the huge amount spent in this sector. In Libya the most sophisticated equipments are used. The huge central-pivot sprinklers are used for irrigation, the country is experimenting with hydro-ponic farming and with oil emulsion to stabilize sand ready for planting. The estimated cost of all these projects is around $ 10,000 per hectare.

From the foregoing discussion we draw one fundamental conclusion that there is a limit to the degree to which the flow of capital could be successfully combined with other factors of production. Even the most modern technology cannot help Libya due to lack of knowledge and skill. The Libyan Government should use its oil wealth more carefully to develop the agricultural sector which will resume an important position after the exhaustion of oil wealth. The most suitable policy for the Libyan agricultural development is the increase in production through economic studies and agricultural programmes for Libyan farmers. Increased use of fertilisers, more investment in land i.e. the intensification of the agricultural sector seems the solution.