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STATE AND AGRICULTURE IN SAUDI ARABIA

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STATE AND AGRICULTURE IN SAUDI ARABIA

BY

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ABSTRACT

STATE AND AGRICULTURE IN SAUDI ARABIA

By

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This study investigates the relationship between state and agriculture in Saudi Arabia. The analysis examines the nature of state involvement in agriculture (nomadic settlement and agricultural support) and its outcomes and implications.

The findings suggest that the agricultural support program (loans, subsidies and land distribution) plays a crucial role in the expansion of agriculture and the growth of its production. This growth, however, has not been large enough to achieve a self-sufficiency or a major reduction in food imports except in a few agricultural commodities (i.e.,wheat and eggs). This program also contributes to crop and agricultural concentration.

The study argues that current agricultural support policies are undermining the long-term prospects of rural and agricultural sector. First, farmers and agricultural activities are becoming dependent on agricultural support, which in turn is dependent on oil, an unstable commodity and

a depletable resource. Second, agricultural expansion has accelerated the depletion of underground water, a major yet limited source of water supplies. Third, there is a growing dependency on imported agricultural machinery and foreign labor.

The study contends that the Saudi state involvement in agriculture either through nomadic settlement or agricultural support has been largely driven by politics. Nomadic settlement weakened the tribe as a politically-challenging force and therefore facilitated the process of state establishment. Through the agricultural support, the government extended oil benefits to the rural sector, generating a considerable support and legitimacy in the countryside.

The agricultural support program's recent leniency toward the establishment of large-scale capital intensive farms contributed to capital "accumulation." But this role contradicts the "legitimation" role played by the same agricultural support to small farmers. This is because the expansion of these large-scale operations is increasingly dominating agriculture and undermining the small farmers.

Suggestions for future research in this topic are provided.

DEDICATION

To my beloved father Abdulaziz, my mother Norah,
my brother Nasser, my friend Abdulrahman
Asseri and my country Saudi Arabia.

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TABLE OF CONTENTS

Tabl

LIST OF TABLES

5.1

5.2
5.3
5.4

5.5

5.6
5.7

5.8

5.9

5.10

5.11

5.12

5.13

6.1

6.2

6.3

6.4

6.5

6.6

6.7

6.8

Figure

5.1

5.2

5.3

LIST OF FIGURES

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Chapter I

Introduction

This study presents an analysis of the relationship between state and agriculture in Saudi Arabia by examining three components of the government agricultural policy: land distribution, agricultural loans and subsidies. It also studies the impact of these policies on the agricultural and rural sector, particularly in terms of changes in the structure of agriculture such as: patterns of landownership, size and number of holdings, concentration, mechanization, labor, production, contribution to the economy and other related issues.

These policies and the resulting changes are examined in relation to the general political, social and economic objectives of agricultural development in Saudi Arabia-- that is, the diversification of the national economy through decreasing dependency on oil (a depletable resource) and improving the income and welfare of farmers and rural people. These policies were also designed to maintain regional balance, reduce inequality and keep rural people in rural areas in order to avoid urban congestion (Fourth Development Plan,1985).

Two major issues occupy studies addressing the development of Saudi agriculture: 1) agricultural production

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and its economic viability and 2) physical and environmental constraints such as water shortage (e.g., Crary, 1951; Ebert, 1965; Beaumont, 1977; Joffe, 1985; Looney, 1988). The study's focus transcends these economic and environmental aspects by extending the analysis to include the political and social dimensions. Through investigating these agricultural policies and their impacts on the structure of agriculture, the study provides insight about the nature and motive behind state involvement in agriculture, and the social consequences of this involvement.

This study is divided into seven interrelated chapters. Following this brief introduction is Chapter II, **State and Agriculture,** which reviews some of the relevant studies on the relationship between state and agriculture in both developing and developed societies.

Chapter III, **Saudi Rural and Agricultural Sector Before 1970,** provides historical background about the Saudi agricultural and rural sector. Among the major issues discussed in this chapter are: the nature of land holding and ownership, cropping pattern, the rise of oil economy and the rural urban migration and the process of planned nomadic settlements.

Chapter IV, **Saudi Rural and Agricultural Sector Since 1970,** addresses the main agricultural objectives under the development plans; the three major components of agricultural policy since 1970; and some of the changes occurring in the

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sector especially with regard to land cultivation, production, agricultural employment, land holdings and the role of agriculture in the economy.

Chapter V, **The Role of Agricultural Policies on Rural and Agricultural Changes**, presents an assessment of the contributions of the components of agricultural policy (land distribution, subsidies and loans) to agricultural growth, mechanization, concentration and labor. It also evaluates the outcomes in relation to the pursued agricultural objectives.

Chapter VI, **The Future of Saudi Rural and Agricultural Sector**, discusses this sector's prospects in connection with the findings from Chapter V. It examines the linkages between oil and the agricultural support program and the implications of these linkages. It also addresses the issue of agricultural expansion in relation to the limited supplies of water. In addition, it provides comments on the implications of the emerging structure of agriculture.

Chapter VII, **Summary, Conclusion and Suggestions for Future Research**, highlights the main findings and points of the study and attempts to relate them to the major findings and arguments regarding the relationship between state and agriculture. It also provides some recommendations for future research in this topic.

Chapter II

State and Agriculture

Introduction

This chapter reviews some of the major studies and arguments regarding the relationship between state and agriculture. The discussion includes the motifs behind state intervention in agriculture; the consequence of state intervention, particularly with respect to agricultural growth, concentration and labor displacement and the rising inequality in the rural sector; and the nature of state intervention.

Agriculture as a part of the economy has been a subject of state involvement and intervention in both developed and developing countries (Koc,1990). Although the nature and extent of state intervention in agriculture differ from country to country and, in the same country, from one epoch to another, the fact remains that " agricultural policy is as old as the state itself" (Granbery, 1986:243).

Irrespective of the nature of state intervention in agriculture (collection of taxes, provision of subsidies, land settlement, land reform or other forms), agricultural policies in both developed and developing countries play a fundamental role in shaping and restructuring the structure of the agrarian economy (Koc, 1990).

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The increasing role of the state in changing the rural sector's social and economic structures has been attracting and generating a growing body of research in both developed (e.g., Mann and Dickinson, 1980; Havens and Newby , 1986, Granberg, 1986) and developing countries (e.g., Bedrani and Bourenane, 1987; Titilola, 1987).

The focus of studies in this field has been on understanding the nature and consequences of state intervention in agriculture. The following sections, therefore, attempt to present and discuss the major debates and findings in this subject.

Motives Behind state intervention

State involvement in agriculture is attributable to a range of economic and social factors. At the economic level, agricultural policy attempts to stimulate agricultural growth. State policy, whether in the form of land reform, subsidies or other expenditures on agriculture, helps in the process of capital "accumulation." (Granberg, 1986; Green, 1987). The generated surplus is then channeled to stimulate and generate growth in other sectors of the economy e.g., industry (Amsden, 1985; Birtek and Keyder, 1975; koc,1990). In this respect, the development of agriculture per se, although desired, is not the ultimate goal of state intervention. Agriculture is

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regarded as a main source of capital and a mechanism for economic development.

Socially, state involvement in agriculture usually attempts to solve or mitigate "structural problems" such as income inequality between people in agriculture and people in other sectors of the economy. It also assists in the persistence and reproduction of small farmers, independent producers (Granberg, 1986; Glavanis and Glavanis, 1983; Friedmann, 1978). This is often referred to as the "legitimation" function of the state (Green,1987).

The outcomes of state intervention in agriculture do not always meet these objectives. As seen in the next section, agricultural policies have often produced unintended contradictory results, such as social inequality in the rural areas.

Consequences of State Intervention

Production growth, agricultural concentration, labor displacement and social inequality are among the major phenomena found to associate with increasing state involvement in agriculture. These interrelated issues are the subject of investigation in the following discussion.

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Agricultural Growth

Ample evidence suggests that the state agricultural policy has contributed largely to agricultural development in many developed and developing countries. Land reform and government expenditures on agriculture (irrigation, research, subsidies..etc.) have been found in many cases to yield positive effects. (Sain, 1980; Amsden, 1985; Ashraf and Bonuazizi, 1980; Mann and Dickinson, 1980; Granberg, 1986).

Bonanno (1988) argued that a direct result of the Italian land reform was improved agriculture. Money that was paid to the "latifundists" as compensation for the expropriated land stimulated additional investment in agriculture. Elias (1981,1985) found that in nine Latin American nations (Argentina, Bolivia, Chile, Costa Rica, Colombia, Mexico, Peru and Venezuela) "government expenditure policy is responsible for at least 10 percent of the growth of agriculture output" (Elias, 1981:10). His study revealed that government expenditure affected agricultural output both directly and indirectly through its impact on agricultural inputs such as labor, capital and mechanization. In other words, government expenditure on agriculture positively affected productivity and overall output, contributing six percent (on average) to the growth of agricultural output and twenty percent to total productivity between 1950 and 1980.

In the Punjab state of India, Bhalla et al (1990) found that by adopting and supporting the use of modern technology

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(mechanization and seed-fertilizers), agricultural policy brought about a "phenomenal increase in wheat and rice yields" (p.9). They praised government expenditures in agriculture in areas like irrigation, researchwnd extension services, roads and other rural infrastructure, arguing that these expenditures contributed largely to farmers' adoption of new technologies that in turn stimulated agricultural growth at a rate as high as 4.6 % between 1950 and 1965. This led them to conclude that " the policy lesson to be learned from the Punjab experience is that large investment in rural and urban infrastructure is a precondition for agricultural development and for rapid growth of both agriculture and other sectors of the economy" (Ibid:88).

In the United States, Mann and Dickinson (1980) indicated that a major consequence of government support and sponsorship of agricultural research during the "monopoly capitalism" era was an enormous growth of agricultural production.

Yet, government policy and intervention in agriculture do not always produce agricultural growth. For example, Bouami and Raki's (1987) findings indicated that despite the Moroccan state planning and expenditures on agriculture through credit and other forms of assistance, the sector's " development remained unsatisfactory" (p.172). Agricultural policy's neglect of the traditional sector was seen as the primary cause behind agricultural policy's failure to achieve satisfactory growth.

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Titilola (1987) found that the Nigerian government adopted policies and programs to support agriculture (e.g., subsidization, extension and development, farm input supplies, etc.) in an effort to achieve self-sufficiency. Yet "the performance of Nigeria's agriculture has not been encouraging" (p.361). His findings revealed that the agricultural share in the GDP declined from sixty percent in 1964 to only eighteen percent in 1980; its share of export dropped from seventy percent in 1964 to less than five percent in 1979, with steadily increasing food import expenses. Titilola attributed such poor performance to several factors including " the early neglect of food crops in favor of export crops" (p.356).

Agricultural Concentration and labor Displacement

Government intervention in agriculture has often been accompanied by an expansion in the areas under the control of a few large holdings. Ashraf and Banuazizi (1980) reported that Iranian land reform increased land concentration. They found that although the percent of holdings with more than one hundred hectares remained at 0.2 % , total areas increased from 8.7 % in 1960 to twelve percent in 1972. But the portion of holdings with less than two hectares increased from forty to forty five percent, while the area controlled remained unchanged at only five percent.

During the "monopoly capitalism" era of the United States

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development, the government adopted an "intensive" agricultural policy, establishing and sponsoring agricultural research and development. The research findings contributed enormously to the growth of agricultural production. At the same time they accelerated capital involvement in, and domination of, agriculture (Mann and Dickinson, 1980). The findings played a major role in developing technologies and methods (e.g., machine, fertilizer, pesticide, refrigeration ..etc.) which helped in reducing and overcoming those "obstacles" inherent to agricultural spheres, such as the gap between labor time and production time and the perishability of some agricultural commodities (Mann and Dickinson, 1978).

Concentration in U.S agriculture reached a point that made Vogeler (1981) argue that the idea of "family farm" predominance in U.S agriculture was becoming a "myth." He supported Mann and Dickinson's (1980) findings, arguing that government agricultural policy, through its support of research at land grant universities and other support programs, contributed to the decline of family farms and the ascendancy of agribusinesses in U.S agriculture. Subsequent studies on the role of state policy in U.S agriculture also support this argument (e.g.,James, 1986; Havens,1986).

Another major result of agricultwal research has been the generation of various types of technology for agricultural use. The application of these technologies have resulted in major reductions in labor use in agriculture(Flinn and

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Buttel, 1980). These processes of agricultural concentration and labor reduction in turn have contributed enormously to rural-urban migration (Berardi, 1981).

Inequality in the Countryside

One major objective of land reform and government intervention in agriculture has been to improve the quality of life and conditions for rural people (Mathur,1980). Ashraf and Banuazizi (1980) found that the Iranian land reform brought some improvements in the "standard of living in rural areas" (p.44). The villagers' per capita expenditure rose from 7,205 rials in 1957 to 9,150 rials in 1971. Another related consequence was the decline of sharecropping. Land reforms transformed many sharecroppers and tenants into independent owners. Similarly, Rhee (1980) indicated that the Korean land reform not only transformed "landless tenants into independent farmers," but also "liberated Korean farmers from the old exploitative land tenure system (the landlord-tenant system)" and created a more "modern egalitarian society" (p.340). Bonanno (1988) found that the Italian land reform, through the distribution of farms absorbed a large portion of labor surplus reducing the " social tensions" in the country. He also found that land reform weakened the struggle and movement of the peasants to replace it with a solidarity with the state. The peasants "saw the small plots of land they obtained

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through the reform as the embodiment of their long-awaited goal of being landowners" (p.141-42).

Nevertheless, this was not always the case. The association between government intervention in agriculture and rising inequality is commonplace. Sarma (1981) pointed out that in India, achieving " self-sufficiency" in food was a priority for agricultural policy, particularly in the 1960s. To achieve such an objective agricultural policy adopted new technologies based on high-yielding varieties programs. Although some growth in food grain was achieved, Sarma found this strategy resulted in widening disparities between farms and regions. He also noted that the introduction of and expansion in the use of technology-- particularly harvest combines-- " resulted in labor displacement" (p.27). These consequences, he argued, contradicted the main objectives of the five year development plans which sought to " improve the standard of living" and promote " the welfare of the population" (Ibid:10).

Bouami and Raki (1987) argued that one factor behind the low success rate of agriculture in Morocco was the uneven growth generated by inequalities embedded in agricultural policy, such as the policy's favoring irrigated areas. For example, in 1979, while irrigated areas compromised only twenty percent of grain production, it used 44.3 % of the state's tractors. The dry area, which compromised forty percent of the grain production, utilized only nineteen

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percent of the state's tractors. A similar pattern was noted for fertilizer use (Ibid:173).

Inequality was also found in land distribution policies which favored the "agrarian bourgeoisie." For example, in 1956 the agrarian bourgeoisie were granted access to 500,000 hectares; "small farmers" received only 350,000 hectares of distributed land. Bouami and Raki (1987) contended that although state assistance to agriculture claimed to assist small and large farmers without discrimination, the big farmers in practice were more "profitable" (Ibid:176).

In Nigeria, Titilola (1987) noted that the agricultural policy's failure to achieve its goal of self-sufficiency was only part of the story. Agricultural policy, he argued, created a kind of inequality in the rural sector. The two major factors found to be mainly responsible about such new development were: 1) the Land Use Decree of 1978 which favored the establishment of large-scale farms and 2) the unequal treatment of farmers during the implementation of agricultural projects such as the Agricultural Development Projects (ADPs) financed by the World Bank. In these projects, some of the farmers were selected as "progressive farmers" and given special treatment in the distribution of agricultural inputs (p.371).

The "Algerian experience" provides a similar example. According to Bedrani and Bourenane (1987) after achieving independence, Algeria demonstrated a sincere commitment to

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improve the agricultural and rural sectors and to the "righting of social wrongs caused by the colonial process" (p.321). These social wrongs referred to the poverty of rural people and the emerging gap between rural and urban populations. To achieve these objectives the government increased its support to and investment in agriculture through land reform, technology, water resource development and soil conservation and rehabilitation.

The outcomes of this policy, however, did not achieve the pursued objectives. Despite some improvement of rural conditions and the standard of living, "the rural-urban gap has remained unbridged. In some areas, in fact, the gulf has widened, thus providing continued impetus to the drift from the countryside and from farming, while worsening production conditions in the rural areas" (p.342).

"Agricultural welfare" was adopted in the United States during the "monopoly capitalism" era to deal with the growing problem among farmers of falling food prices due to overproduction. The major objectives of this policy were to curtail production and stabilize farm incomes. Farmers were given public funds on the basis of participation in "acreage allotments" and "marketing quotas." In addition, farmers were paid to cover the "difference between the prevailing market price for commodities and government 'target' or support price," the "parity" policy (Mann and Dickinson, 1980:305).

This support program, Mann and Dickinson (1980) argued,

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played a major role in the process of agricultural concentration and inequality. This was due mainly to the method of support distribution. Distribution was carried out on the basis of each farmer's proportional share to total production. This method allowed big farmers to receive the largest portions. For example, in 1969, 42.4 % of government "benefits" were received by the "wealthiest" five percent of the farmers, while the "poorest" twenty percent of the farmers received only 1.1 % of these benefits. Therefore, they concluded that

> the consistent inequalities in the distribution of farm benefits indicate a growing divorce between the formal claim of the government to be supporting and protecting the family farm as the backbone of rural America and the impact of its actual farm programs which disproportionately benefit large enterprises and hence further the ruination of small holders (Ibid:308).

The Nature of State Intervention

In order to understand the inconsistent results from state intervention in agriculture revealed by the proceeding discussion, one must have an adequate grasp of the nature and logic of state policies.

O'Connor (1973) introduced a theory called "the fiscal crisis of the state." He outlined the process and factors behind state involvement in the economy. According to

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O'Connor, the capitalist state worked to "fulfill two basic and often mutually contradictory functions, accumulation and legitimization"(p.6). Accumulation refers to the process in which state expenditures assist the growth of private capital; this, in turn, provides a source of power for the state. Legitimation, on the other hand, denotes the process in which the state, in order to maintain the loyalty and support of its citizens, works to preserve "social harmony" in its society.

Although this theory was developed to explain the nature of the United States governmental fiscal process, it was extended to some extent to state agricultural policies in capitalist states. State agricultural policy demonstrates a contradictory nature (see Buttel, 1982; Marsden et al, 1986; Green, 1987).

On the one hand, state expenditure for agriculture helps small farmers (independent producers) to survive and cope with the problems inherent to agriculture; it also improves the welfare of rural people and farmers. In this regard the state's involvement in agriculture is geared to fulfilling the legitimation function. State's authority is legitimated in exchange for farmers' benefits.

On the other hand, state intervention and support to agriculture (e.g., subsidy and research) stimulates and encourages capital involvement. While this increases agricultural production and growth (accumulation), it also leads to the process of agricultural concentration and the

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displacement of agricultural labor and small farmers. The result is a threat to the state's legitimacy. In order to maintain its legitimacy, the state provides more spending and support to agriculture, mainly to assist independent producers. This circular and contradictory process continues, giving rise to a dependent form of agriculture that constantly relies on state assistance and intervention (Granberg,1986).

There is a reciprocal relationship between the state and the economy. As the state's expenditure plays a major role in shaping the structure of the economy, the reverse holds as well. State policy and expenditure are affected by the nature of its income source. In a country where the state derives its income from " external" sources (i.e., oil exports), the state usually has a distinctive relationship with the domestic economy from that enjoyed by a state generating its income from internal sources (i.e., taxes) (Luciani, 1987).

A state that generates most of its income from external sources in the form of rent is called a "rentier" or "exoteric" state; an "esoteric" state depends largely on domestic sources of income. The source of the state's income is the influential factor of this categorization. Therefore, rent externality is crucial to the concept of a rentier state (Madhavy, 1970; Beblawi, 1987; Luciani, 1987).

A rentier state is the recipient of external rent (revenues) and acts as the mediator between external revenues and the rest of the economy. In other words, the rentier

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state, as the recipient of the external revenues, ends up distributing these revenues to its population. This means that a predominantly rentier state will be a distributive or "allocation" state (Abdel-Fadil, 1987; Luciani, 1987). The Arab oil states (including Saudi Arabia), having depended largely on oil exports as their main source of income which is then distributed to the rest of the population, represent an excellent example of both rentier and allocation states (Beblawi, 1987).

The external source revenues (oil exports) fundamentally influence the relationship between the state and the domestic economic structure. A state that receives a substantial part of its income from abroad not only plays the dominant role in the economy but usually also enjoys a substantial "autonomy" from the domestic socio-economic structure. The revenues from external sources (oil exports) free the state from raising its income domestically. They also improve the state's ability, through allocation, to generate legitimacy, thereby increasing its stability (Luciani, 1987).

Because of its reliance on taxation, the production state has a vested interest in the expansion and growth of the income base from which taxes can be levied. But for the rentier state that depends on income generated from abroad, allocation is the only relationship it needs to have with its domestic economy (Ibid). In fact, a rentier state, by "being independent of the strength of the domestic economy, does not

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need to formulate anything deserving the appellation of economic policy: all it needs is an expenditure policy (Ibid:74).

Yet, it has been argued that a state will tend to be more stable in history if it commands sufficient resources to ensure its survival (Ibid). In this regard, it may be concluded that since oil, the principal foundation of the Arab oil states economy, is a depletable, non-renewable resource, the allocation state of the Arab oil countries is certainly " a passing phenomenon" (Ibid:82).

There are two possible options facing the Arab oil allocation states: on the one hand, they may continue without change until the final drop of their oil is exported. At that time, they may simply fold up and the countries collapse economically. On the other hand, being confronted with rising internal demands that are more than they can handle or by opinion and pressure from the outside world, they may pursue a policy of economic diversification, gradually turning into production states (Ibid).

It is not surprising to see that in Arab oil states (including Saudi Arabia) an attempt is being made to pursue a policy of economic diversification. The states have been utilizing oil revenues to expedite this process of economic diversification through spending part of the oil income on productive projects and activities-- agriculture. This process of diversification is intended to both decrease the dependency

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on oil in order to prolong its life and to strengthen the economic base so the state can resort to a new source of income (taxes) when oil prices and revenues tumble or when oil runs out.

In this respect, the allocation state's expenditure converges to that of the production state. On one hand, it aims largely at generating the support and loyalty of its population and hence its stability, the legitimation function. On the other hand, it attempts to induce and stimulate the growth of the domestic economic base that will ensure against oil depletion, hence the state's long-term stability, the accumulation function.

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Chapter III

Saudi Rural and Agricultural Sector Before 1970

Introduction

Saudi Arabia lies within the harsh environment of the arid zone. Except in the mountains of the southern region which receive some moisture due to monsoons, rain is very scarce and irregular (El-khatib,1980). Yet, people inhabit this desert region, having survived for many centuries. Two major activities assisted in their survival-- settled agriculture, which developed in oases along the valleys, and nomadic herding. This chapter discusses the nature and economy of these two activities and how they were affected by the rise of the oil economy and state policies before 1970. The discussion covers issues such as land holding and ownership, patterns of cropping and planned nomadic settlements.

Land Holding

Land holdings were generally very small. Most holdings did not exceed one hectare (Senani,1983). Stevens (1972) indicated that in the Al-hasa oasis in the eastern province of the country, more than seventy per cent of the total holdings

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were less than one hectare (ha.) in size. In the oasis of Unayzah, in the central province, Sharif found that in 1961 twenty percent of all land holdings were half a hectare or less; forty five percent were 2.5 hectares or less and only twenty percent were more than 10 hectares (Altorki and Cole,1989).

According to the first national agricultural census (conducted between 1960 and 1964 and hereafter referred to as the 1964 agricultural census) 87,111 agricultural holdings in the country covered a total area of 462,614.6 ha. (Ministry of Finance and National Economy, 1967). This means that on average the size of the land holding was 5.3 ha. Table 3.1 presents a land holdings classification according to size of the holding as found by the 1964 agricultural census.

Table 3.1 Number of Holdings Classified by Holding's Size in 1964

Size (Donum)	No. of Holdings	% of Total
Less than 5	43444	49.87
5-50	36470	41.87
50-100	3687	4.23
More than 100	3510	4.03
Total	87111	100.00

Source: Ministry of Finance and National Economy,1967:138. Note: 10 donum= 1 ha.

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holdings in the country did not exceed 50 donums or 5 ha (a standard that was set up to be the minimum for land distribution as seen in the next chapter).

Many factors worked to limit the size of land holdings:

1- a general low level of mechanization and technology use in agriculture.

2- a limited access to arable land. Lands that could be cultivated at that time, given the low level of mechanization, were limited to some oases where surface water was in abundance and accessible or to the southern mountains with a higher relative availability of rain.

3- fragmentation due to the inheritance system.

4- limited access to markets. In the past transportation was based on camels and donkeys. In addition, the country had a low population. The best estimate put the population at 4,649,100 in 1958 and 5,362,284 in 1965 (AL-ruwaithy,1979). Beside the small size of the population, income was limited as well resulting in a low level of consumption particularly among the nomads and rural people. This limitation of consumption and market reduced the demand for agricultural products and hence the need to farm more land and produce crops. Therefore, agriculture was subsistence-oriented and limited to some exchange with nearby communities or nomads (e.g., Twitchell,1953; Dequin,1976; Al-ruwaithy,1979; Hajrah, 1982; Al-sadairy,1984).

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Land Ownership Patterns

In settled agriculture most land holdings were owned and operated by their owners (Hajrah,1982). According to the 1964 agricultural census about ninety two percent (421,961.2 ha.) of the total area of holdings (462,614.6 ha.) owned and operated by holders, while only eight percent (or 40,653.4 ha.) was rented (Ministry of Finance and National Economy,1967). However, there was a variation among the country's different regions. For example, in the eastern province sharecropping was common. In the Al-hasa oasis, for instance, it was reported that as much as fifty percent of the holdings were exploited by sharecroppers, due to the increase of the oil industry which attracted many of the landowners (Joffe,1985).

A similar situation occurred in the central province. Altorki and Cole (1989) indicated that farmers in the Unayzah Oasis in the Qaseem region used sharecropping as the most common practice. The farmers (or "fallalih") would enter into sharecropping arrangements with the land owners, most of whom were merchants. The most common arrangement used was one where the landlord provided developed land, including a well. The sharecropper provided seeds, animals, fertilizers, labor and irrigation costs. The landlord received one-third of the wheat; one-third of the palm trees produce or a combination of the two. The sharecropper received the remaining two-thirds plus any other crops grown on the land (Altorki and Cole,

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Among the nomads, land ownership was of a different type. Each tribe had a certain area called "dirah" (or dira) where they camped during the summer season and practiced some cultivation activities. The dirah was surrounded by grazing land that the tribe roamed, searching for suitable places for their livestock to graze. Each tribe owned the right to protect its dirah and the surrounding land in a normative system of rights and duties known as the "hema." The dirah and the hema were collectively owned and protected by each member of the tribe. The collective ownership entitled each member of the tribe to freely roam and graze his/her animals (e.g., Al-fair,1977; Cole,1980,1981).

The delimitation of tribes' territories was in most of the times flexible and changeable based on the tribes' agreements and the changing conditions of grazing. Frequently, however, there was a lack of agreements and therefore the intrusion of some members of a tribe (usually for grazing, wood cutting and hunting) in what another tribe considered its territory easily erupted into conflict and fight between the tribes. In fact, inter-tribal fights and raids whether because of territorial encroachment or camel confiscation was an integral "part of the basic economic and political life of the desert as an expression of the continuous struggle for existence" (Senani, 1983:8; also see Al-fair,1977).

Rights to individual property were of no value to the

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nomads. This was because of the nature of their economy and way of life which were mainly based on spatial mobility. Nomads roamed the desert in search of vegetation and grass following the fall of a scarce rain (Senani,1983).

In 1953 the government issued a decree abolishing the hema system and making all rangelands accessible to any one who wished to graze the lands (Cole,1980; Hajrah,1982). The objective of such a decree was "to remove one of the major reasons underlying the endemic warfare and feuding characteristic of Arabia before the consolidation of the present nation-state of Saudi Arabia" (Cole,1981:142).

However, the abolition of the hema system accelerated the disintegration of the tribe, the main political, social, military and economic unit in Arabia. At the same time, the decree contributed greatly to the process of central government development. The abolition of the hema undermined the political independence of the tribe because

> it replaced the practice of agreements and alliances between tribes, upon which the tribes depended in order to be able to exploit the resources of another dira, with an all-embracing code. In this way the state asserted its right to intervene in a field which until then had been the domain of tribal politics. Thus the tribes lost one of their principal functions, that of protection and management of the communities' interests as regards access to the resources (Fabietti,1982:193-4).

Patterns of Cropping

Wheat, barley, grapes, watermelon, tomatoes, onions and some other kinds of cereals, vegetables and fruits were grown in the country. However, dates were the main crop. Dates were the population's main diet and were the most suitable crop for such a harsh environment with the scarcity of water and a high degree of soil salinity (Twitchell,1953; Ebert,1965; Senani,1983). Ebert (1965) indicated that in the Al-qutif oasis, in the eastern province, about ten thousand acres of the land were under irrigation. Ninety percent were devoted to date palms. Table 3.2 below indicates the area and production for major crops in the country in different years.

Table 3.2 Area and Production for Some Agricultural Crops (area in ha. and production in metric ton)

Crop	1950		1957		1963	
	Area	Output	Area	Output	Area	Output
Wheat	21800	20200	43800	42836	89890	129201
Barley	17163	15268	23800	23800	29182	48244
Other All Field Crop	28875	35832	87800	102179	56857	58790
Vegetables	67838	71300	155400	168815	175929	236235
Dates	4128	29226	3000	21240	33132	345485
Other Crops	21752	150000	43900	23500	22281	257606
All Crops	1598	105131	5100	334250	11487	86000
	95316	355657	207400	547805	242829	925326

Source: Al-Sadairy,1984:172.

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The cultivated area, as illustrated by table 3.2, was very small compared to available cultivable lands in the country. Available data indicate that a total of about 4.5 million hectares could be cultivated in the country (El-khatib,1980; Tuncalp and Yavas, 1983; Elgari, 1983). This means that in 1963 only about five percent of the arable land was under actual cultivation.

Until the early 1960s the method of farming was a simple one. Farming was performed by human-power with additional use of animals in plowing the land and bringing water from the wells. Crary (1951) indicated that in the Alhofuf oasis in the eastern province "cultivation is entirely by hand. No animal has been observed doing any plowing or cultivating work. In contrast with Al-karj, where bullocks are frequently used. The farmers' only tools are large and small mattocks and a sickle-type hand knife" (p.38).

The introduction of mechanization into Saudi agriculture was accomplished through two processes. The first was the use of pumping machines for irrigation and the second was the utilization of tractors for plowing and cultivating the land (AL-Zaidy,1980).

The first use of agricultural machines was in the Al-karj project in 1937. Some Pumps were imported followed by six tractors to the same project (Crary,1951). However, this was mainly for experimental and demonstration purposes and it took some time for increased availability and acceptance by the

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general farming population. The 1964 agricultural census found that the number of agricultural machines in the country consisted of 24,936 irrigation machines, 277 tractors and 49 threshers (Ministry of Finance and National Economy, 1967). Since 242,829 ha. were under cultivation in 1963 (Table 3.2), there was an irrigation machine for each 9.7 ha, a tractor for each 876.6 ha, and a thresher for each 4,955.7 ha. In other words, the mechanization level was still quite low despite the twenty-five year period since the first appearance of mechanization in Saudi Arabia.

The nomads roamed the desert following the grass after the rain falls. They raised sheep, goats and camels. Camels in particular were the principal livestock, not only because they were better adapted to desert conditions but also because they constituted the main source of wealth and living for the nomads. Camels provided a main source of food (meat and milk), clothing, housing material and transportation. In addition, selling camels was a major source for needed cash. In short, camels were the symbol of life and wealth to the nomads (Senani, 1983; Cole, 1981).

However, the abolition of the hema system in 1953 and the increasing availability of trucks to the nomads (thanks to governmental loans and subsidies through the agricultural ministry) accelerated rangeland destruction. Making rangelands accessible to any one who wanted to graze them and the easy mobility provided by the trucks led to overgrazing and the

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Surveys conducted by the Saudi Ministry of Agriculture between 1960 and 1964 found that the total areas of the rangelands amounted to 120,671,825 ha. About twenty eight percent (or 33,674,775 ha.) of these areas were completely destroyed (El-khatib, 1980). Table 3.3 provides a classification of the rangelands based on the assessment of these surveys.

Table 3.3 Classification of the Rangelands' Area

Range Land Classification	Areas (ha.)	%
Excellent	10188437	8.4
Good	37557168	31.1
Fair Land Not Denuded	39251445	32.5
Poor Land Completely Destroyed	33674775	28.0
Total	120671825	100.0

Source: El-khatib, 1980:22. Percentages are calculated by the author.

Agriculture and the Economy

When Saudi Arabia emerged as a nation-state in 1932, the economy was little more than subsistence-based. Agriculture, which encompassed cultivated oases and nomadic herding, was the main economy base. It provided both the livelihood of the

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population and was the main source of employment. Agricultural oases were self-sufficient and subsistence-oriented as was the nomadic herding. These activities were well-suited and adapted to the harsh environment and its scarce resources (i.e., water). "The mode of production under which the bedouin operate does not lead to increased production of any thing beyond the bare necessities." (Cole, 1981:130). However, some limited exchange and trading existed between oases and also with the nomads and nearby towns and countries (Stevens, 1972; Senani, 1983).

Oil production in commercial quantities in the early 1950s rapidly began to reverse this equation. Oil not only began replacing agriculture as a major sector of the economy but also impacted agricultural activities in various aspects. After studying nomads in various parts of Saudi Arabia, Ibrahim and Cole (1978) concluded that

> economically, the significance of the bedouin in Saudi life has undergone dramatic change in recent decades. Owners of huge herds of camels, sheep and goats, the bedouin in pre-oil times accounted for the greatest wealth of the nation. This important economic role, however, has been eclipsed in the last quarter century by the wealth derived from oil(p.3-4)

Increased oil revenues (Table 3.4) provided the government with capital to invest in developing the Saudi

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infrastructure. Because government expenditures were tilted toward urban centers and oil-related industries, more opportunities and better living conditions rose in the urban centers (Minstry of Planning, Third Development Plan 1980-85:59, Fourth Development Plan 1985-90:419-421; Ministry of Municipal and Rural Affairs, 1984:22). Two major consequences resulted that were related to agriculture. First, rural people and the nomads began migrating to urban centers in search of their share of the wealth. Because of this growing rural-urban migration, particularly among young people, agriculture began to rapidly deteriorate. This was not only because many farmers abandoned their farms, but because the agricultural labor market drastically decreased. At the same time, wages were increasing to the extent that farm income was no longer able to cover labor costs (e.g., Al-ruwaithy 1979; Al-sharif,1986; Lackner,1978; Cole,1981).

The magnitude of rural-urban migration was very high. For example, the best estimate in 1932 put the percentage of the nomads at 57.69 % of the total population. By 1974 nomads constituted only 26.9 % of the total population (Al-ruwaithy, 1979). Agricultural employment (including nomads), on the other hand, was estimated at ninety percent in the 1950s. By the early 1980s it had dropped to only twenty five percent (Nyrop,1984). Lackner (1978) pointed out that "in 1969, in the Garith, Sulays Bishak and Khamis Mushayt regions of Asir....

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Table 3.4 Oil Revenues 1950-- 1969
(Million US $)

Year	Amount	Year	Amount
1950	56.7	1960	333.7
1951	110.0	1961	377.6
1952	212.2	1962	409.7
1953	169.8	1963	607.7
1954	236.3	1964	523.2
1955	340.8	1965	662.6
1956	290.2	1966	789.7
1957	296.3	1967	909.1
1958	297.6	1968	926.8
1959	313.1	1969	949.0

Source: SAMA, Annual Report 1962,1972.

(South-Western Region)... 13,500 men between the ages of 15 and 55, out of a population of 37,500 men of this age group, had abandoned nomadism and left the region." (p.175) As table 3.5 indicates, the major cities in the country witnessed a phenomenal growth. In light of the previous argument, this growth may be attributed in major part to rural-urban migration.

The degree of agricultural deterioration was obvious particularly in the southern region. Al-sharif (1986) found that in Jizan the cultivated lands numbered 110,000 ha. in 1968; by 1973 only 43,880.7 ha. were under cultivation-- a loss of 66,119.3 ha. or sixty percent in five years.

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Table 3.5 Population Growth in the Major Cities of the Country

City	1940 (a)	1962 (b)	1970 (b)	1974 (a)
Riyadh	30000	170000	350000	672382
Jeddah	30000	148000	250000	568046
Makkah	80000	159000	300000	366801
Taif	5000	54000	100000	282913
Hofouf	30000	115000	130000	237990
Medinah	20000	72000	85000	198186

Source: (a) Al-angari, 1990:166; (b) Senani,1983:110

Available data indicate that this agricultural deterioration resulted in a continuous decline of agriculture's contributions to the total gross domestic product (GDP). Table 3.6 shows that agriculture's share in the total GDP declined from ten percent in 1962 to about six percent in 1969.

Table 3.6 Share of Agriculture in GDP (Million SR at current prices)

Year	Total GDP	Agricultural Amount	GDP %
1963	8603.7	866.2	10.0
1964	9205.2	908.8	9.9
1965	10257.5	874.4	8.5
1966	11775.6	839.4	7.1
1967	13078.6	862.4	6.6
1968	14458.1	895.7	6.2
1969	15810.2	974.4	6.2

Source: 1963-1969, SAMA,1969:97.
[US $1 = 3.75 SR 1991 prices (Asharq Al-awsat, 1991, 14 (4735):12)].

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Second, oil revenues not only led to an improved standard of living but also attracted many expatriates to work in the oil industry and related infrastructures. These two factors increased the level of food consumption and introduced changes to the dietary system which, in turn, raised the demands for food. Stevens (1972) pointed out that a survey conducted by ARAMCO (Arabian American Oil Company) on its Saudi employees found that

> between 1962 and 1968, there was an increase in average household expenditure of 47 per cent from £ 792 to £ 1165 with the amount spent on food rising from £ 407 to £ 575. When this expenditure on food is analyzed, the amount spent on fresh fruit and vegetables has increased far more rapidly than on any other category of food with over £ 111 being spent on these commodities in 1968 (p.325)

The rapid increase of demands for food made local production unable to meet the demands for food. Food imports was an immediate solution and grew dramatically. Total food imports increased from 41,679 tons in 1947 (Asfour,1965) to 702,210 tons in 1969 (Al-sadairy,1984).

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State and Agriculture

The first attempt by the government for the planned settlement of nomads (or "guided sedentarization," Fabietti,1982) accompanied the process of unifying the country under one central government. To achieve this objective, King Abdulaziz, the founder of Saudi state, "knowing that a modern political state could not be realized while social disorder prevailed in the country, resolved to undermine nomadism gradually by settling the bedouins around water points" (Hajrah,1982:40).

Under Abdulaziz's order, many places within the tribal rangelands were prepared and the nomads were given incentives to settle in such places. These places were known as "hejar" (or hijer). The incentives included subsidies for daily subsistence and assistance in farming such as seeds for crops (Ibid).

The hejar settlement policy lasted from 1912 to 1932, when Saudi Arabia was organized into a nation-state. There is no agreement on the number of hejar established estimates range from 122 to 550. But the policy succeeded in settling a large number of nomads and their tribes. For example 40,000 persons were settled in Motir centers, 30,000 in Utaiba centers, 40,000 in Harb centers and 50,000 in the Shammar, Al-Awazim and Al-Murrah centers (Ibid:38).

However, the hejar policy was not a complete success. Some hejar collapsed and their residents moved either to other

settlements or urban centers. Some even returned to nomadism (Cole,1981).

Many factors contributed to this failure:

1- the unfamiliarity of some nomads with farming.

2- the discovery of oil and ensuing opportunities for better living conditions near the oil sites which attracted nomads' migration.

3- the circumstances accompanying the establishment of hejar. Many hejar were hastily established without prior studies of their suitability for agriculture in terms of water availability, fertile soil and access to markets (e.g., hajrah,1982).

The second stage for nomadic settlement was largely triggered by social factors. In the early 1960s a severe drought hit the country particularly in the northern section. Many of the nomads' livestock died and they grew desperate in their search for assistance. The government, represented by the Ministry of Agriculture and Water responded immediately, establishing a large project for nomadic settlement in the north with the objective to assist the nomads financially and provide them with help to continue cultivation in an attempt to raise their standards of living and establish a more reliable source of income and livelihood (Cole,1981; Hajrah, 1982).

The Ministry of Agriculture and Water allocated a sum of 2,040,000 SR (Saudi Riyal) in the 1960 budget for this

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project. However, costs continued to increase until they reached 12,726,888 SR (US $ 2,828,197) by the year 1970 when the policy came to an end. The project encompassed 29 hejar (settlements) and benefitted 644 utilizers (families) who received an average of about 1.6 ha. of land each totaling 1,024.54 ha. of farmed area. The ministry also provided 259 irrigation pumps (Hajrah, 1982).

Due to project's urgency, it was established without a full study to determine the availability and suitability of water, soil and other factors. Some problems of water shortage and soil salinity rose later, leading to the abandonment of some farms and even to the collapse of some settlements. However, the project realized some economic and social gains. For example, the cultivation of these areas increased agricultural production. These settlements became sources of supplies for dates and vegetables to the neighboring towns. Also the project helped in providing social services, such as education and health, to the nomads who settled and to those who came to the settlements for summer camping (Ibid).

The success of the nomads' planned settlements in such hejar was only partial at best. Many nomads left the settlements, making their way to urban centers (Al-fair,1977; Lackner,1978; Al-abbadi,1981; Cole,1981). In this regard, the settlements played a major role as "instruments for the transition process between nomadism and sedentary life." (Lackner,1978:177) In these settlements the nomads

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lived a semi-nomadic way of life. They continued herding and at the same time practiced settled agriculture, living in permanent houses. Their children received education which taught them the skills they needed to operate in new social and economic arrangements. The settlements helped the "nomads make the socio-psychological transition between nomadic herding and the tribal solidarity associated with it, and the urban context, where relations are impersonal" (Ibid:177).

The above cases of land distribution mainly targeted nomads. For the rural areas, another system of land distribution was introduced by King Abdulaziz in 1939. Under this system public land was leased to potential farmers. The terms of the agreement dealt with the local governor but the lease had to be approved by the king. Under such a contractual procedure the lessee, after the expiration of the ten year lease, owned three quarters of the holding and the remaining quarter belonged to the government. Every year the lessee had to pay a quarter of production in kind to the government without deducting any costs or expenses for the services from the government's share. However, in practice the government did not receive any produce for its share from any lessee, even from those whose leases had expired. Until this policy expired in 1972, a total of 2,087 leases were recorded, mainly in the eastern province (Hajrah, 1982:51).

Distributing land along the contracting procedure was not sufficient enough to meet the growing demands for land

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ownership, particularly in the 1960s. Between 1960 and 1965 about 4,627 applications were submitted to the ministry of agriculture. Such increasing demands caused the government to review its policy of land distribution . The Ministry of Agriculture and Water undertook major surveys to determine suitable and viable land for agricultural use to be distributed to potential farmers. At the same time, a series of discussions and debates were held between the Ministry of Agriculture and Water, the Ministry of Finance and National Economy and consultants for the Cabinet of Ministers. The result was a formulated national policy for land distribution known as the Public Land Distribution Ordinance (PLDO) that was approved by a royal decree in 1968 and is still in effect (Hajrah,1982).

Because this ordinance's implementation mainly began in 1970, its discussion shall be reserved for the next chapter. In the meantime, it should be indicated that the distribution of land was not limited to the normal procedure under the supervision of Public Land Management Department at the Ministry of Agriculture and Water even after the PLDO was issued in 1968. As Table 3.7 shows, about 2,973.6 ha. of land were given to individuals by royal orders between 1964 and 1971 (Ibid).

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Table 3.7 Lands Distributed by Royal Orders 1964-1971

Year	Distributed Areas (Donum)	Number of Beneficiaries
1964	11425.8	57
1965	4078.0	119
1966	883.0	8
1967	410.0	7
1968	8089.4	317
1971	3850.0	8
	29736.2	509

Source: Calculated from Hajrah,1982:79.

Two major government agencies were (and are) involved in agriculture: the Ministry of Agriculture and Water (MAW) and the Saudi Arabian Agricultural Bank (SAAB). MAW was established in 1953 to carry the following responsibilities: agricultural related researches, training and eduction for agriculture, provide subsidies to agricultural inputs (such as seeds, fertilizers,machinery), establish agricultural related infrastructures and projects (such as dams and roads) and the provision without charge of protective materials for plants and animals (e.g., herbicides, insecticides and pesticides) and land distribution as indicated earlier (Al-Turki,1986; El-khatib,1980).

To fulfill such a task, the Ministry was provided with a growing allocation in the national budget. MAW budget increased from 287 million SR in 1965 to 487.5 million SR in 1969. Most of MAW's efforts and expenditures during the 1960s

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focused on conducting studies and surveys to explore and determine the feasibility and potential of agricultural development in the country, particularly in terms of water availability and arable lands.

SAAB was established in 1962 and began its operation in 1964 to "act as government credit center to finance the various fields of activity in agricultural sector" (SAAB:4). SAAB provided three types of loans: short-term, medium- term and long-term.

The short-terms loans are directed to activities related to seasonal crop production and marketing such as seed, chemical fertilizers and plowing charges. Loans in this category are given for a period not exceeding one year (SAAB:5).

Medium-term loans, extend to more permanent activities and agricultural equipment such as engines, pumps, irrigation equipment, well drilling, machinery, construction of watering facilities, water reservoirs, collection pools, rooms for machinery and workers, pipe bleachers and green houses in addition to costs of shoots and nursery plants, manure and fertilizers, fishing gear and bee-keeping requirements and leveling costs. This type of loan extends for a period not exceeding 10 years (Ibid). Table 3.8 shows that between 1964 and 1969 SAAB provided a total of 69,979 thousand SR in short- and medium-term loans covering a variety of agricultural activities.

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Table 3.8 Agricultural Loans 1964-69 Classified by Fields (Thousand SR)

Year	Fields of Loans			
	Machinery	Fertilizer	Other	Total
1964	3468	127	3595	4545
1965	7883	158	1987	9928
1966	7948	241	5104	13293
1967	7099	235	4666	12000
1968	6936	349	6592	13877
1969	7769	410	7957	16136
Total	41003	1520	29901	69979

Source: Calculated from SAAB, Saudi Arabian Agricultural Bank in Twenty Years.

It is clear from Table 3.8 that 41,003 thousand SR or sixty percent went to agricultural machinery (pumps, engines and ploughing machines) during this period. The number of machines financed by SAAB loans included: 60 ploughing machines, 8,525 engines and 5,443 pumps (Ibid:50-51).

The Long- term loans "are extended for a period not to exceed 25 years and cover fallow land reclamation of large areas." (SAAB:5) SAAB never reports data pertaining to such a type of loans an indication that they are seldom, if ever, granted.

It should be indicated that SAAB loans are interest-free. However, SAAB does charge 30 SR on short-term loan (for the first time and 15 SR thereafter) and 80 SR on medium term loan. This charge covers inspection fees and is designed to ensure the seriousness of the applicants (Ibid:6). To guarantee repayment of its loans, SAAB requires one of the

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following options:

1) mortgage of fixed assets,
2) gold or jewelry,
3) unconditional and irrevocable bank guarantee issued by a commercial bank operating in Saudi Arabia which is acceptable to Agricultural Bank as being in sound financial position,and
4) personal guarantee by one or more persons acceptable to the Bank and whom the Bank considers financially able (SAAB:6).

Loan collection is a process that SAAB takes seriously to the degree "that the Bank refrains from giving loans to farmers who delay or fail to pay their installments when due without just cause." (Ibid:13) Such a policy helped SAAB, as Table 3.9 indicates, to collect more than seventy percent of each year's total dues.

Table 3.9 The Collection of SAAB's Loans 1964-69
(Thousand SR)

Year	Total Loans	Total Due	Total Collected	% Collected
1964	4545	77	68	89.0
1965	9928	1431	1189	83.1
1966	13293	4225	3401	80.5
1967	12000	8105	6317	77.9
1968	13877	11304	8386	74.2
1969	16136	16939	12839	75.8

Source: SAAB, Saudi Arabian Agricultural Bank:35,72.

Beginning 1973, SAAB disbursed subsidies for various agricultural activities. This issue, however, will be dealt with in the next chapter.

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Conclusion

This chapter offered a discussion of Saudi Arabia's Rural and agricultural situation before 1970. The main objective was to provide a background and an introduction to a more detailed analysis in the next chapters of the Saudi agriculture in 1970s and 1980s which is the main focus of the study. Understanding major issues such as past cropping patterns, land holdings and ownership and the nomadic settlements is not only valuable in itself but also necessary if the current situation and policy of Saudi agricultural and rural sector are to be fully understood and appreciated.

It was apparent from the discussion that agriculture was largely subsistence oriented. Because of this and other factors, such as limited mechanization, land holdings were generally very small.

The rise of oil economy and the subsequent opening opportunities in the urban centers and oil sites triggered a massive exodus among the nomads and rural people. This in turn left a marked impact on agriculture.

Three steps of state involvement in agriculture took place before 1970: 1) nomadic settlement, 2) abolition of the tribal hema system, and 3) the establishment of the ministry of agriculture and the agricultural bank. The first two steps played a major role in the establishment of the state. The second provided some assistance to the process of agricultural mechanization and generated some data regarding agricultural

potentials and constraints which provided a base for subsequent agricultural planning. Furthermore, the abolition of the hema transformed some of the unutilized arable land to the public land (owned by the government) which served as the basis of public land distribution as will be seen in the next chapter.

The next chapter, will address Saudi agricultural and rural sectors after 1970. The selection of 1970 as a dividing point of the development of agriculture into two stages, pre- and post- 1970, does not imply a separation. They represent both a single and a continuous process of development and change.

Two major factors suggested this distinction. First, and most important, 1970 coincided with the inception of planned development which was inaugurated by the First Development Plan (1970-1975). The development plans began approaching each sector of the economy, including agriculture, with systematic-and well-organized strategies for change and development. Second, in the early 1970s, particularly after the oil embargo, oil revenues rapidly increased as did the process of agricultural and rural transformation.

Therefore, the main focus of the next chapter will be a discussion and an analysis of the agricultural objectives and policies under these development plans and the main changes that accompanied these policies application.

Chapter IV

Saudi Rural and Agricultural Sector Since 1970

Introduction

This chapter discusses the Saudi rural and agricultural sector during the past twenty years. This period was covered by four development plans extending for five years each. The discussion addresses the main objectives of agricultural development under each plan; the government agricultural support program which includes subsidies, loans and land distribution; and the major changes in the sector particularly in terms of land holding and ownership, agricultural labor, cultivation, production and agriculture's contribution to the economy.

Agricultural Development Objectives

The main objective of agricultural development under the First Development Plan (1970-75) was to increase local food production. The plan aimed at increasing agricultural output by about twenty seven percent and meat production by about forty seven percent. Increasing food production remained a major concern under the subsequent plans, but new dimensions were introduced to this objective. The growth of local food production was intended to "minimize the Kingdom's dependency on imported food" (Second Development Plan, 1975-80:123),

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achieve "a prudent level of self-sufficiency" (Third Development Plan, 1980-85:150) and to contribute to "the diversification of the economic base" (Fourth Development Plan, 1985-90:179).

Another major objective of agricultural development especially since the second plan (1975-80) has been to raise the income and improve the welfare of farmers and rural people. The second plan also aimed at improving agriculture through mechanization in order to "release surplus labor for employment in other sector" (Second Development Plan, 1970-80:123). But by the inception of the Fourth Development Plan (1985-90) this objective was reversed. Agricultural development, the plan aimed, would generate more employment in agricultural sector and related agro-industries. This shift in objective was intended to encounter rural exodus to urban centers which increased during the proceeding plans.

Agricultural Policies

The plans adopted agricultural policies which were largely based on agricultural support program. This program included three components: The distribution of free lands to potential farmers, subsidies and loans to major agricultural activities. The intention of this support program has been to accelerate agricultural mechanization, encourage and assist private investment in agriculture, promote commercial

agriculture, bring more land under cultivation and attract and encourage nomads integration in social and economic structures (First Development Plan, 1970-75:256-57).

The advent of the third plan (1980-85) marked the development of a new direction in agricultural development. The plan strongly recommended "the encouragement of the private sector in the development of large scale agricultural projects" (Third Development Plan,1980-85:150). This does not imply that the plan suggested the abandonment or neglect of the traditional sector (small farmers). In fact, the plan recommended continuing improving the "efficiency of the traditional sector by the adoption of modern farming methods that minimize labor and water inputs"(Ibid:150). Nevertheless, more attention was directed toward the expansion of these large farms because a perceived more efficiency and productivity. As will be seen later, in spite of the short history of this type of farming operation, they became the major player in Saudi agriculture.

Agricultural Subsidies

Under the First Development Plan, set of agricultural subsidies was introduced. These subsidies were to be extended to a variety of agricultural inputs (i.e.,machinery and fertilizers) and outputs (see Table 4.1).

The application of these subsidies continued during the

subsequent plans except wheat subsidies which were raised to 2.0 SR/kg in 1978 then to 3.5 SR/kg in 1979 and since 1986 reduced to 2.0 SR/kg (Grain Silos and Flour Mills Organization, 1987).

Table 4.1 Type and Amount of Subsidies Introduced During the First Development Plan

Type of Subsidy	Year Introduced	Amount
Input Subsidies		
Machinery	1973	45 % of Price
Fertilizer	1973	50 % of Price
Animal Feed	1973	50 % of Price
Poultry Farms	1974	30 % of Price
Dairy Farms	1974	30 % of Price
Transportation of 200 or more dairy cattle *	1975	Total Cost of Transportation
Output Subsidies		
Wheat	1973	SR 0.25/kg.
Sorghum	1973	SR 0.25/kg.
Rice	1973	SR 0.30/kg.
Sheep	1974	SR 10.00/Head
Camels	1974	SR 50.00/Head

Source: Ministry of Planning, Second Development Plan,1975-80:122.
* Air transportation of imported cows.

The amount of agricultural subsidies increased from four million SR in 1972 to 3,739.5 million in 1987 (Table 4.2). Subsidies extended during this period amounted to 26,253.5

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million SR. Of this sum 5,347.9 million SR or 20.4 % were devoted to agricultural machinery (engines, pumps, tractors, poultry raising equipments and dairy farm equipments).

Table 4.2 Agricultural Subsidies 1970-1989 (Million SR)

Development Plans	Year	Agricultural Subsidies Machinery	Other	Total
First Plan	1970	0.0	0.0	0.0
	1971	0.0	0.0	0.0
	1972	0.0	0.0	4.0
	1973	3.2	7.8	11.0
	1974	31.3	37.7	69.0
Second Plan	1975	96.6	236.5	333.1
	1976	114.9	488.1	603.0
	1977	151.6	570.4	772.0
	1978	251.6	627.1	878.7
	1979	287.7	346.1	633.8
Third Plan	1980	494.5	362.1	856.6
	1981	629.1	731.0	1360.1
	1982	860.0	1247.9	2107.9
	1983	672.1	2226.8	2898.9
	1984	657.0	4083.8	4740.8
Fourth Plan	1985	444.9	3370.3	3815.2
	1986	393.4	3087.4	3480.8
	1987	260.0	3479.5	3739.5
	1988	n.a	n.a	n.a
	1989	n.a	n.a	n.a

Source: Calculated from Al-hababi, 1989; SAAB, SAAB in Twenty Years, Annual Report 1985-1989. n.a=not available.

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Agricultural Loans

Although as seen in the previous chapter agricultural loans were in existence before the inception of the development plans, they witnessed a remarkable growth since then. Between 1970 and 1988 Saudi Arabian Agricultural Bank (SAAB), the agency responsible for extending credit to agriculture, provided 23,030.9 million SR in short-and medium-term loans to farmers covering a variety of agricultural fields. The share of agricultural machinery and fertilizer amounted to 7,686.3 million SR and 697.9 million SR or 33.4 % and three percent respectively (Table 4.3).

Land distribution:

As indicated in the previous chapter, a final policy regarding land distribution was reached in 1968 by the formulation of Public Land Distribution Ordinance (PLDO). PLDO signaled the beginning of a systematic procedure for land distribution which commenced with the First Development Plan.

The term "public land," as stated in the ordinance, refers to any land wherein the following conditions are met:

> a) It should be free from existing rights of proprietorship or appropriation. 2) The economic advantage of its utilization for agricultural or animal production should be clear. 3) It should be outside the boundaries of the inhabited areas and their related interests in both towns and villages (Hajrah, 1982:68).

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Table 4.3 Agricultural Loans 1970-1989 (Million SR)

Development Plans	Year	Agricultural Loans Machinery	Fertilizer	Other	Total
First Plan	1970	5.5	1.1	10.0	16.6
	1971	5.9	.5	10.2	16.6
	1972	16.6	.7	2.3	19.6
	1973	15.0	1.2	20.1	36.3
	1974	46.2	2.8	96.5	145.5
Second Plan	1975	86.0	4.0	179.4	269.4
	1976	134.7	6.3	348.8	489.8
	1977	184.7	8.1	392.9	585.7
	1978	297.3	9.3	402.5	709.1
	1979	365.2	14.8	748.8	1128.7
Third Plan	1980	771.1	68.6	1691.2	2530.9
	1981	755.2	69.1	2108.6	2932.9
	1982	1254.1	104.7	2807.2	4166.0
	1983	799.5	94.9	2601.4	3495.8
	1984	1188.6	306.1	827.1	2321.8
Fourth Plan	1985	527.6	2.6	1021.0	1551.2
	1986	523.0	.3	495.9	1019.2
	1987	377.7	1.8	461.8	841.3
	1988	332.4	1.0	421.1	754.5
	1989	n.a	n.a	n.a	n.a

Source: Calculated from SAAB, SAAB in Twenty Years; Annual Report 1985-1989. n.a=not available.

To receive a plot of land under the PLDO, the applicant, whether an individual or a company, has to be a Saudi citizen unless approval from the Cabinet of Ministers is given. The applicant also should have received no land under PLDO before. If the applicant is a company, the company should be "qualified" for farming activities. This condition can be met by having a constant capital of 500 thousand SR or more solely

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devoted to cultivation or animal raising and at least four employees who are qualified and highly trained in agricultural sciences (MAW, Regulations for the Implementation of Public Land Distribution Ordinance).

Under PLDO the land allotted to individuals is limited to a minimum of 5 ha. and a maximum of 10 ha. and up to 400 ha. may be granted to a company unless the Cabinet of Ministers approves a larger maximum (Ibid). A trial period of two to five years (depending on the nature of the allotted plot in terms of soil, accessibility of water, difficulty of development and the location in terms of transportation and facilities) is given to the allottee to develop the land and bring it under production. During this grace period the allottee is given the right to appropriation and utilization but not ownership. The right to ownership is conditioned by the allottee seriousness in utilizing the land by developing at least twenty five percent of the land in the case of an individual and thirty five percent in the case of a company. If the trial period passed without the allottee meeting this requirement the right to appropriation may be lost and MAW may transfer the plot to another applicant (Ibid).

Between 1970 and 1988 1,241,033 ha. of fallow land were distributed under this scheme to potential farmers. Of this distributed areas 366,172 ha. or 29.51 % were granted to 59,482 individuals averaging at 6.2 ha. each, 614,927 ha. or 49.55 % were given to 5,175 agricultural projects receiving an

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average of 118.8 ha. each and 259,934 ha. or 20.94 % were received by twelve agricultural companies averaging at 21,661.2 ha. each. It is noteworthy that the distributed lands to agricultural companies did not adhere to the 400 ha. level established as a maximum for a company by PLDO. In 1986, for example, one company received 60,000 ha. which is 150 times this maximum level (Table 4.4). This is a sign that land distribution favored the establishment of large scale farms. Although this accord with third plan policy, it played a major role in agricultural concentration as will be seen in the next chapter.

Agricultural Labor

Due to more governmental expenditures on urban centers (Ministry of Planning, Third Development Plan 1980-85:59, Fourth Development Plan 1985-90:419-421; Ministry of Municipal and Rural Affairs, 1984:22), rural-urban migration continued particularly during the first two plans. Consequently the number of people working in agriculture declined specially among the nomads. The Second Development Plan (1975-80) estimated that agricultural employment during the first plan period decreased by about 19.7 thousand who left the agricultural sector for other sectors. Nineteen thousand participants of this exodus were nomads (Ministry of Planning. Second Development Plan, 1976:67).

Table 4.4 Land Distribution to Individuals, Projects and Companies 1970-1989.

Plans	Year	Distributed Lands to Individuals No.	Individuals Area	Projects No.	Projects Area	Companies No.	Companies Area
First Plan	1970	n.a	10500.0	0	0	0	0
	1971	2953*	5649.7	0	0	0	0
	1972	2268	14265.5	0	0	0	0
	1973	389	3823.3	0	0	0	0
	1974	101	645.5	0	0	0	0
Second Plan	1975	767	5209.0	3	520	0	0
	1976	189	1091.0	3	1200	0	0
	1977	971	5682.0	20	1007	0	0
	1978	4140	34205.0	21	429	1	5000
	1979	1559	7813.0	17	523	0	0
Third Plan	1980	6075	29018.0	29	2662	0	0
	1981	1225	6286.0	76	8968	0	0
	1982	2709	14413.0	122	14666	2	20025
	1983	8480	47690.0	638	77131	5	127900
	1984	7853	46881.0	774	100510	2	12009
Fourth Plan	1985	4186	24558.0	651	82680	1	35000
	1986	3954	30236.0	949	67101	1	60000
	1987	6732	45988.0	774	102952	0	0
	1988	4931	32213.0	1098	154578	0	0
	1989	n.a	n.a	n.a	n.a		n.a

Source: SAMA, Annual Report 1970-74; MAW, 1990.
* Includes 1970. n.a= not available.

Similarly, the third plan (1980-85) estimated that agricultural employment during the second plan (1975-80) decreased by about 96.2 thousand or an average of 2.94 % annually (Third Development Plan 1980-85:101).

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The main causes for this decline in the agricultural labor, the second plan argued, were " low real incomes in agriculture and increasing opportunities for well-paid employment in other sectors" (Second Development Plan 1975-80:115).

The second plan estimated the decrease in the nomadic population at two percent annually. This rapid migration among the nomads was not the result of low income alone; it was also caused by the nomads' "lack of immediate access to most social, educational, and other services" (Ibid:422). This factor in particular reduced the nomads' chances to integrate into the new economy and resulted in a growing inequality between nomads and urban dwellers. The nomads, the second development plan argued,

> have a complex and highly developed social, economic, and legal system that has adapted to change over many hundreds of years. Nevertheless, the pace of change in the rest of the Kingdom has recently been so fast that the economic and social gap between the bedouin and the reminder of the population is widening (Ibid:422).

The economic gap penetrated deeply. A study conducted by the Ministry of Labor and Social Affairs found that while the average annual income of a nomad's household totaled 14,200 SR, in "very large cities," the household average annual income was 80,400 SR (Table 4.5). In other words, on average the city dweller received about 5.7 times more than the nomad.

Table 4.5 Annual Average Income of Nomads, Rural and Urban Population (SR)

Population	Head of The Household	Total Income of Household
Nomads	11200	14200
Rural	16200	20700
Urban:		
Small Cities	35300	43600
Large Cities	33400	44900
Very Large Cities	58000	80400

Source: Senani, 1983: 137.

Rural-urban migration, particularly during the 1970s, clearly affected the distribution of the country population. In a ten year period (1970-1980) the percentage of people living in metropolitan areas more than doubled while that of rural and small towns experienced a sharp decline.Metropolitan populations increased from twenty percent of the country's total population in 1970 to forty two percent in 1980. But rural populations decreased from sixty percent in 1970 to only forty six percent in 1980 and small towns populations declined from twenty percent in 1970 to only twelve percent in 1980 (Ministry of Planning, Third Development Plan 1980-85:56).

The decline of agricultural employment accorded with the second plan's objectives sought to " release surplus labor for employment in other sectors" (Second Development Plan, 1975-80:123). However, there was little if any surplus to begin with and therefore, such a "release" came at the expense of agriculture.

Cultivation and Production

The decline in agricultural labor impacted agriculture. According to the second plan (1975-80) "this decline is already reflected in abandoned farmland and partly depopulated villages, particularly in the Southwestern Region" (Second Development Plan 1975-80:115). The impact was more severe in the traditional sector. By the beginning of the third plan (1980-85) "the continued exodus of labor has made the labor input expensive and in short where, for example, dates in some area are only partially harvested because of lack of labor" (Third Development Plan 1980-85:149).

As Table 4.6 indicates, cultivated areas during the first two plans fluctuated which in turn reflected on agricultural production. Production fluctuations were more severe in cereals and meat than in other commodities.

Because of the fluctuations in land cultivation, production of some agricultural commodities did not meet the first two plans' expectations. As Table 4.7 shows, during the first plan production of wheat, barley, sorghum and millet,

Table 4.6 Agricultural Cultivated Areas and Production 1970-1989 (Area in Thousand ha. Production in Thousand Ton)

Development Plans	Year	Cultivated Areas	Production					
			Cereals	Veg.	Fruit	Meat	Milk	Eggs
First Plan	1970	n.a	213*	141	307*	43*	156	5
	1971	405.0	185	171	362	47	172	5
	1972	256.1	110	653	240	52	189	6
	1973	286.3	113	399	355	101	217	7
	1974	600.9	299	674	434	87	225	9
Second Plan	1975	512.9	288	884	458	81	206	12
	1976	585.9	282	597	360	87	234	16
	1977	556.4	295	744	384	84	253	21
	1978	561.0	301	546	529	80	309	27
	1979	616.1	340	705	525	87	343	30
Third Plan	1980	608.7	266	756	470	94	349	44
	1981	434.8	306	718	497	139	235	49
	1982	597.0	488	1292	509	188	311	71
	1983	731.3	875	1089	577	239	361	98
	1984	782.7	1444	1313	658	287	374	104
Fourth Plan	1985	946.4	2191	1443	686	348	414	132
	1986	947.4	2463	1284	714	426	432	137
	1987	1061.8	2934	1912	781	444	477	114
	1988	1162.3	3612*	1987	792	473*	498	103
	1989	n.a	n.a	n.a	n.a	n.a	n.a	n.a

Source: MAW, Bulletin of Agricultural Sample Survey 1970-75; A annual Bulletin of Current Agricultural Statistics 1984/5; Agricultural Statistical Yearbook 1988; Chamich, 1983; Ministry of Planning, Statistical Indicator 1985; 1990. * Estimates. n.a= not available.

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fish and dairy productions in 1974 fell short of the plan's projection for the same year. Sorghum and millet production, for example, was less than the plan's target by 164 thousand tons.

Table 4.7 Comparison Between First Development Plan Target and Actual Production For Some Agricultural Commodities (Thousands Ton)

Agricultural Commodities	Final plan Year Target (a)	Actual Production in 1974 (b)	Difference Actual-Target (c)
Wheat	231	153	- 78
Barley	56	15	- 41
Sorghum & Millet	291	127	-164
Dates	240	360	120
Vegetables	693	674	-19
Fruit	100	434	334
Broilers	6	11	5
Fish	36	20	-16
Dairy Products	250	225	-25

Source: (a) Ministry of Planning, First Development Plan,1970:255.
(b) Ministry of Planning, Achievement of The Development Plans 1970-1989, 1990:271,272.
(c) Calculated by the author.

Similarly, during the second plan (1975-80) in spite of some growth , production of some agricultural commodities failed to reach the levels projected by the plan. For example, actual production in 1979 was far less than the targeted level by 109 thousand ton for wheat and by 243 thousand ton for

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sorghum and millet production (Table 4.8).

Table 4.8 Comparison Between Second Development Plan's Target and Actual Production for Some Agricultural Commodities (Thousand Tons)

Agricultural Commodities	Plan Target for 1979 (a)	Actual Production in 1979 (b)	Difference actual-target (c)
Wheat	250	141	-109
Sorghum & Millet	425	182	-243
Barley	10	13	3
Vegetables	300	705	405
Dates	300	405	105
Citrus	20	31	11
Milk	280	343	63
Meat	55	38	-17
Broiler	20	30	10

Source: (a) Ministry of Planning; Second Development Plan, 1976:128-9. (b) Ministry of Planning,1990:271-2. (c) Calculated by the author.

During the third and fourth plans (1980-85, 1985-90) Cultivated areas increased rapidly. In fact, for the first time sine 1970 and probably in the history of Saudi agriculture, areas under cultivation during the fourth plan exceeded one million ha. This increment in area under cultivation was accompanied by a phenomenal growth in production. For example, cereals production rose from 226 thousand ton in 1980 to 2,934 thousand ton in 1987 (Table 4.6).

Use of Modern Inputs

During the last two decades The process of agricultural mechanization increased tremendously. As Table 4.9 shows, between 1974 and 1982 the number of engines and pumps more than double. The number of tractors in use in 1982 was more than 28 times that of 1974. Similarly, the use of chemical fertilizer in 1982 was almost five times that of 1974.

Table 4.9 Use of Engines, Pumps, Tractors and Chemical Fertilizers 1974 and 1982

Inputs	1974	1982	% Change
Engines	64634	152738	136.3
Pumps	62319	149448	139.8
Tractors *	735	20693	2715.4
Chemical Fertilizer **	37673	175698	366.4

Source: Calculated from MAW , Comprehensive Agricultural Census: The Kingdom Aggregate (VOL.1) 1973-74; The General Findings of The Comprehensive Agricultural Census Based on Agricultural Directorates 1981-1982. * Track-and Wheel-Tractors. ** Metric Ton.

In 1974 there were 600.9 thousand ha. under cultivation (Table 4.6). This means that on average there was an engine for each 9.3 ha., a pump for each 9.6 ha., a tractor for each 817.6 ha. and 62.7 kg. of chemical fertilizer for each ha.

In 1982 there were 597 thousand ha. under cultivation (Table 4.6). This means that on average there was an engine for each 3.9 ha., a pump for each four ha., a tractor for each

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28.9 ha. and 294.3 kg. of chemical fertilizer for each ha. This indicates a major increase in the use of agricultural modern inputs.

Land Holdings and Ownership

During the last two decades the structure of agriculture underwent a considerable change. As Table 4.10 indicates, the number of agricultural holdings increased from 180,670 holding in 1974 to 212,157 holding in 1982. Similarly, the areas under the holdings expanded from 12,134,623 donum (1,213462.3 ha.) to 21,350,332.4 donum (2,135,033.24 ha.) during the same period. Therefore, the average size of agricultural holding increased from about 6.7 ha. in 1974 to about 10.1 ha. in 1982.

However, the increase in the average size of holding was more a result of the increase in the number of holdings more than 100 ha. While the average size of holdings less than 5 ha. remained unchanged from 1974 to 1982 at 1.3 ha., the average size of holdings more than 100 ha. increased from 269.3 ha. in 1974 to 346.4 ha. in 1982 (calculated from Table 4.10). The areas under the large holdings increased from 35.5 % in 1974 to 47.0 % in 1982. It is clear that agricultural land was largely in the hands of a few holders and that the change was toward more concentration. In 1974 about 87.5 % of the holders controlled only twenty five percent of the

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agricultural land, while 12.5 % of the holders controlled seventy five percent of the agricultural lands. In 1982, 83.7 % of the holders had only seventeen percent of the agricultural lands, while only 16.3 % of the holders had eighty three percent of the agricultural lands. Furthermore, in 1974 less than one percent (0.9 %) of the holders controlled 35.4 % of the agricultural lands and in 1982 only 1.4 % controlled forty seven percent of the agricultural lands. This can be attributed in large part to the policy of land distribution which inclined toward the establishment of large scale agricultural operations.

Between 1975 and 1982 about 158,717 ha. of fallow lands were distributed to potential farmers (individuals, projects and companies). This contributed to the increase of areas under the holders' ownership. As Table 4.11 illustrates, between 1974 and 1982 owned areas increased by about 87.1 %, while rented areas increased by only 1.2 %.

The percent of areas of holdings under the holders' ownership increased from eighty two percent in 1974 to eighty seven percent in 1982, while rented areas declined from sixteen percent in 1974 to only nine percent in 1982 (Table 4.11).

Table 4.10 Number and Area of Holdings 1974 and 1982 Classified by the Holding Size.

Size (Donum)	No. of Holdings				Area of Holdings (donum)			
	1974		1982		1974		1982	
	#	%	#	%	#	%	#	%
< 5	34213	18.9	39566	18.6	93343	.8	113237.0	0.5
5-50	106205	58.8	114129	53.8	1752078	14.4	1913516.1	9.0
50-100	17722	9.8	23962	11.3	1188072	9.8	1600657.1	7.5
100-1000	20936	11.6	31603	14.9	4808379	39.6	7687069.9	36.0
> 1000	1594	.9	2897	1.4	4292751	35.4	10035852.3	47.0
Total	180670	100.0	212157	100.0	12134623	100.0	21350332.4	100.0

Source: MAW , Comprehensive Agricultural Census: The Kingdom Aggregate (VOL.1) 1973-74; The General Findings of The Comprehensive Agricultural Census Based on the Level of Holding Size 1981-1982.
Note: 10 donums= 1 ha.

Table 4.11 Areas of Holdings According to Land Tenure in 1974 and 1982 (Area in Donum)

Tenure	1974		1982		%
	Area	%	Area	%	Change
Owned	9957449	82	18626958.5	87	87.1
Rented	1960507	16	1984209.6	09	01.2
Other	21667	2	739164.3	04	11.7
Total	12134623	100	21350332.4	100	

Source: Same as Table 4.10.

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Agriculture and the Economy

During the first plan (1970-75) agricultural GDP (value added in agriculture) registered a modest growth in absolute terms but its contribution to the economy declined. Its share in the total GDP declined from 5.2 % in 1970 to 1.1 % in 1974 and its share in the non-oil GDP dropped from 12.7 % to only 6.2 % in the same period (Table 4.9). Furthermore, the growth of agriculture output fell short of the 4.6 % of annual growth projected by the plan. The real annual growth turned out to be only 3.6 % (Third Development Plan 1980-85:20).

Similarly, during the second plan (1975-80) agricultural GDP grew but at a rate lower than the total and non-oil GDPs. Hence, while the absolute value of agricultural output increased from 1,529 million in 1975 to 4,601 million in 1979, its contributions to both total and non-oil GDPs tumbled reaching 0.9 % and 3.0 % in 1976 respectively (Table 4.9).

With the inception of the third plan (1980-85) agricultural GDP began to mark a noticeable growth, increasing from 5,398 million SR in 1980 to 20,895 million SR in 1988. Similarly, Agriculture's contribution to both total and non-oil GDPs grew continuously. Its share of total GDP increased from 1.1 % in 1980 to 7.3 % in 1988 and its share of the non-oil GDP rose from 3.6 % in 1980 to 10.1 % in 1988 (Table 4.12).

Table 4.12 Gross Domestic Product (Total, Non-oil and Agriculture) 1970-1989 (Million SR Current Prices)

Development Plans	Year	Gross Domestic Product (GDP)				
		Total	Non-Oil	Agriculture		
				Amount	% of Total	% of Non-OiL
First Plan	1970	19826	8050	1025	5.2	12.7
	1971	25623	8857	1063	4.2	12.0
	1972	34218	10398	1127	3.3	10.8
	1973	67420	13502	1218	1.8	9.0
	1974	120839	21764	1347	1.1	6.2
Second Plan	1975	156048	38446	1529	1.0	4.0
	1976	191512	59688	1788	0.9	3.0
	1977	222807	82208	3067	1.4	3.7
	1978	246241	102746	4193	1.7	4.1
	1979	341307	125075	4601	1.4	3.7
Third Plan	1980	485879	152240	5398	1.1	3.6
	1981	539064	180394	6535	1.2	3.6
	1982	462255	205662	8345	1.8	4.1
	1983	395817	215336	9645	2.4	4.5
	1984	351398	214869	11620	3.3	5.4
Fourth Plan	1985	313941	216983	13789	4.4	6.5
	1986	271091	203630	15861	5.9	7.9
	1987	275453	205010	18312	6.7	9.1
	1988	285145	215990	20895	7.3	10.1
	1989	n.a	n.a	n.a	n.a	n.a

Source: Ministry of Planning,1990; SAMA, Statistical Summary 1990. n.a = not available.

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Conclusion

This chapter has provided an overview of the Saudi rural and agricultural sector's situation since 1970. It was apparent that some profound changes have occurred, not only in agricultural output and contributions to the economy but also in the structure of agriculture.

Agricultural and rural sector during the first and second plans witnessed some deterioration resulting in part from rural migration, which was triggered by unequal regional distribution of income. Both areas under cultivation and production fluctuated. Consequently agriculture's contributed little to the economy. In contrast, agriculture during the third and fourth development plans registered a high level of growth and improvement not only in the amount of production but also in its contribution to the economy.

Agriculture in Saudi Arabia is increasingly becoming under the control of a few large holders. Between 1974 and 1982 the proportion of large holders (more than 100 ha.) increased from 0.9 % to 1.4 % and the areas under their control increased from 35.4 to forty seven percent, while the proportion of small holders (less than 5 ha.) decreased from 77.7 % to 73.4 % and the areas under their control decreased from 15.2 % to 9.5 % in the same period.

The major component of agricultural policy during the last four development plans was the agricultural support program. This program included disbursement of subsidies to

some agricultural inputs (machinery, fertilizer...etc.) as well as outputs, the extension of credit to agriculture on the basis of interest-free loans and the provision of free lands.

Agricultural support program witnessed a rapid growth particularly during the third and fourth plans which raises questions about the relationship between such changes: questions such as how the changes in the objectives reflect on the agricultural policies and how many of changes in agriculture's performance may be attributed to changes in the agricultural policies?

The next chapter will discuss these issues and attempt to provide an evaluation of agricultural policies and their roles in rural and agricultural sector's change and development.

Chapter V

The Role of Agricultural Policies on Rural and Agricultural Changes

Introduction

Two major objectives have guided agricultural development since 1970: 1) an economic objective which sought to increase food production in order to minimize the country's dependence on imported food and realize self-sufficiency and 2) the social objective which attempted to improve the income and standard of living of rural people in order to maintain a rural-urban balance and curb the migration of rural people to urban centers (Chapter IV).

To achieve these objectives the government adopted an agricultural policy based largely on an agricultural support program. This support program included the distribution of free lands and the provision of free interest loans and subsidies to agricultural activities (Chapter IV).

The previous chapter outlined the main features and changes in these agricultural policy components and some of the changes that occurred in the agricultural and rural sector since the adoption of these policies. This chapter, however, attempts to examine the outcomes of implementing these policies and evaluate them in relation to the two main objectives of agricultural development mentioned above.

Agricultural Growth

As demonstrated throughout the previous chapter, during the last decades, a considerable growth has been achieved in agriculture particularly in the 1980s. For example, agricultural GDP (the value added in agriculture) increased from 1,025 million SR in 1970 to 20,895 million SR in 1988.

To assess the role of the agricultural support program in this growth, a model consisting of six factors (or independent variables) representing this program was developed. These variables were: 1) agricultural loans, 2) agricultural subsidies and 3) distributed areas. But because these factors or variables had the potential to effect agriculture not only in the same year in which they were provided but in subsequent years, three lagged variables were constructed from the original variables. These lagged variable were: 4) lagged agricultural loans, 5) lagged agricultural subsidies and 6) lagged distributed area. Because for each lag there is a loss of one observation (e.g., Ramanathan, 1989; Ostrom, 1990); and since there were a limited number of observations in the study (1970-1988), the lag was limited to one year. Therefore, each lagged variable assumed the value corresponding to the value in the original variable of the preceding year. For example, the lagged agricultural loan variable in 1971 took the values of the original variable (agricultural loans) in 1970.

As evidenced from Table 5.1 there is a significant

relationship between the agricultural support program and agricultural growth. About ninety-eight percent of the variation in the dependent variable (the agricultural output as measured by the value added in agriculture) is explained by the six components of agricultural support program(R^2 = .982).

As the regression coefficients (Betas) and corresponding statistical tests indicate, some of the program components had stronger impacts on agricultural growth than others. However, the separate proportional effect of these components should be interpreted with some caution because there is an inter-correlation between such components (this issue is often referred to as "multicolinearity" and commonly occurs in time series analysis, see e.g. Pokorny,1987; Ramanathan, 1989).

However, the model as a whole fits the data rather well. As the graph illustration in Figure 1 shows, the predicted values by the model are very close to the actual ones. The study findings support findings and comments of some previous studies. For instance, Looney (1990:98) concluded that "agricultural credit has been a major factor accounting for the expansion in the Kingdom's agricultural boom".

As shown in the preceding chapter, local food production registered a noticeable increase. But, a more critical examination of the production growth reveals that this growth was not evenly distributed among the various agricultural crops. In fact, some traditional crops such as barley and

sorghum rapidly declined. Production growth was mainly the contribution of a few crops, especially wheat. As Table 5.2 indicates, the share of wheat production in total cereals

Table 5.1 The Relationship Between The Agricultural Support Program and the Growth of agriculture (1971-1987)

	B	Beta	T.Stat.	T.Sig.
Sqrt (loans)	.0137	.6075	3.630	.0046
Sqrt (lag loans)	-.0129	-.6040	-2.475	.0328
Sqrt (Subsidies)	.0051	.2659	1.082	.3045
Sqrt (lag Subsidies)	.0104	.5415	2.440	.0348
Log (Distributed Area)	.0965	.1672	1.842	.0952
Log (lag Distributed Area	.0868	.1443	1.710	.1181
(Constant)	2.8751		48.502	.0000

R^2	.9817	F.Statistic	89.480
N	17	F.Significance	.000
Durbin-Watson Test	2.2427		
Dependent variables	log (Agricultural GDP)		

Note: Sqrt= Square root, log =log 10. The variables were transformed using the log or the square root in order to "relax" the assumption required by the multiple regression technique (e.g.,Pokorny,1987). Loans, Subsidies and agricultural GDP in million SR. Distributed area in thousand ha.

production increased from 41.2 % in 1979 (the year in which wheat subsidies were raised to 3.5 SR/kg.) to 97.4 % in 1985. Since 1986 (the year in which wheat subsidies were reduced to two SR/kg.) wheat's share has been gradually declining but

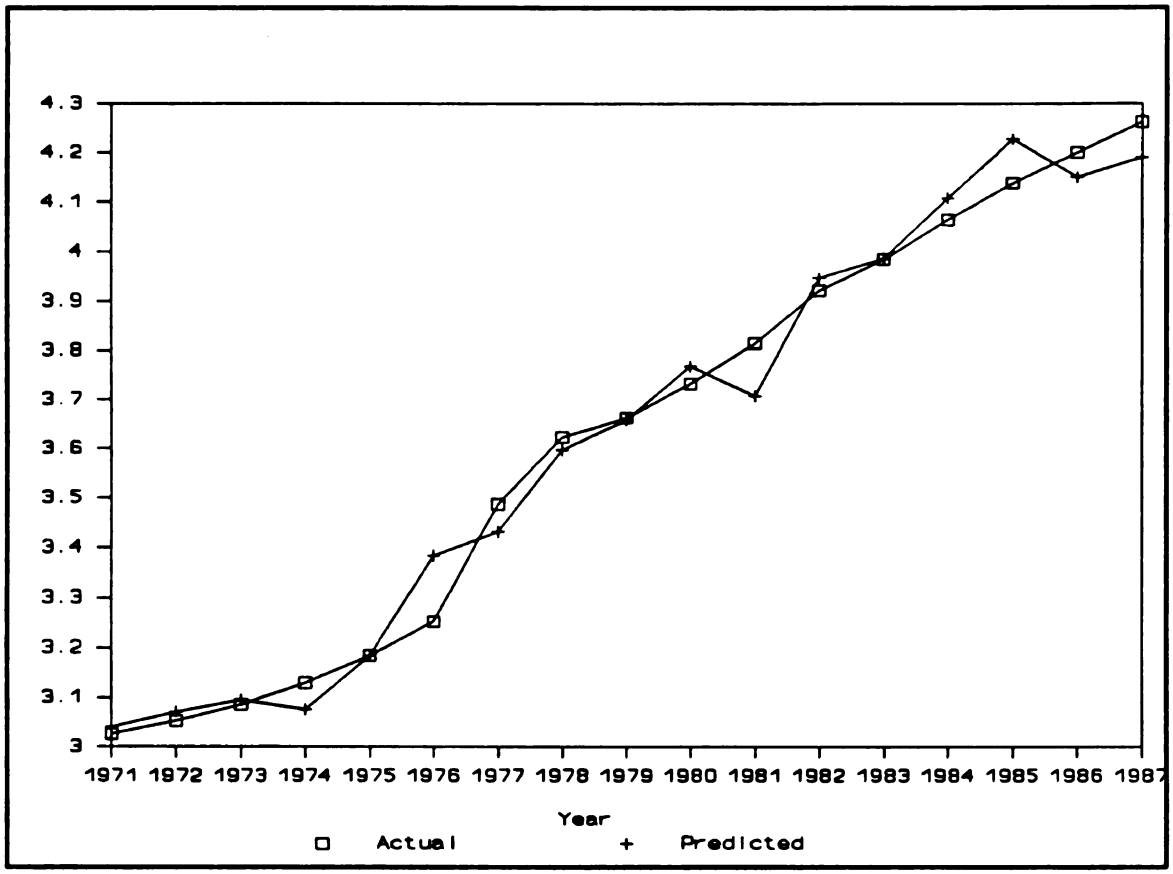

Figure 5.1 Log (agricultural GDP, actual and estimated from a model which includes agricultural loans, lag agricultural loans, Agricultural Subsidies, Lag Agricultural Subsidies, Distributed Areas and Lag Distributed Areas.

still accounts for a large portion.

Since the late 1970s, the main focus of agricultural development was directed toward wheat production. Wheat subsidies were raised from .25 SR/kg. in 1974 to 2.25 SR/kg. in 1978 then to 3.50 SR/kg. in 1979 (GSFMO,1987). These subsidies were paid by Grain Silos and Flour Mills Organization (GSFMO) in the form of price guarantee to the

Table 5.2 Wheat's Share in Cereals Production 1979-1987 (Thousand metric Ton)

Year	Cereals	Wheat	
		Amount	%
1979	340	141	41.2
1980	266	142	53.4
1981	306	199	65.0
1982	488	416	85.3
1983	875	818	93.5
1984	1444	1398	96.8
1985	2191	2135	97.4
1986	2463	2290	93.0
1987	2934	2648	90.3

Source: Ministry of Planning, 1990:271,272.
Percentages are calculated by the author

farmers based on the transfer of their production to GSFMO. This increase in wheat subsidies and the easement of marketing

problems, stimulated a shift to wheat crop particularly by commercial investors.

The volume of subsidies paid by GSFMO to wheat producers grew from 4.7 million SR in 1979 to 3,470 million SR in 1987. Consequently, the share of wheat subsidies within total agricultural subsidies rapidly increased from 0.6 % in 1979 to 92.9 % in 1987 (Table 5.3).

These subsidies, however, only represent GSFMO's direct payment to wheat producers. They do not include the volume of subsidies paid by SAAB or MAW to farming inputs such as machinery and fertilizer to help in wheat production.

Table 5.3 Wheat's Share in Agricultural Subsidies 1978-1987

Year	Wheat Subsidies (Million SR)	% of Total Agricultural Subsidies
1978	4.7	0.6
1979	47.8	7.5
1980	90.6	10.6
1981	231.1	17.0
1982	635.9	30.1
1983	1876.1	64.7
1984	3362.9	71.0
1985	2821.4	74.0
1986	3076.3	88.4
1987	3470.0	92.9

Source: Calculated from Al-hababi, 1989:63.

This dramatic increase in wheat support program was accompanied by a rapid increase of wheat's share in areas under cultivation. Areas under wheat crop increased from 10.7 % of the total cultivated areas in 1978 to 56.7 % in 1987. This increment was mainly achieved at the expense of other traditional crops. For example, areas under sorghum cultivation accounted for 53.9 % of the total cultivated areas in 1978 but tumbled to only 6.3 % in 1987 (Table 5.4). In other words, the crop structure underwent a major change and restructuring.

Table 5.4 Shares of Wheat and Sorghum in Cultivated Areas 1978-1987 (Area in Thousand ha.)

Year	Total Area	Wheat Area	Wheat %	Sorghum Area	Sorghum %
1978	561.0	59.9	10.7	302.5	53.9
1979	616.0	79.3	12.9	371.1	60.2
1980	608.1	67.2	11.1	349.7	57.5
1981	434.8	73.5	16.9	173.4	39.9
1982	597.0	151.1	25.3	95.8	16.1
1983	731.3	245.1	33.5	59.2	8.1
1984	782.7	404.1	51.6	37.7	4.8
1985	946.4	587.4	62.1	37.2	3.9
1986	947.4	566.4	59.8	37.6	4.0
1987	1061.8	601.7	56.7	67.3	6.3

Source: Calculated from Ministry of Finance and National economy, Statistical Indicator 1985; Chamich, 1983; MAW, Annual Bulletin of Current Agricultural Statistics 1984/85; Agricultural Statistical Yearbook 1988.

Wheat subsidies played a major role in this change . As Table 5.5 indicates, there was a significant relationship between subsidies paid to wheat crop and the expansion of the areas under wheat cultivation between 1978 and 1987 (Beta = .976, sig.=.000). About ninety five percent of the variation in the area under wheat crop in this period is explained by the subsidies paid to wheat (R^2 = .952). Figure 5.2 presents a visual illustration of this relationship.

The shift to wheat since the late 1970s was justified by a security concern. The country had become increasingly dependent on imported wheat. This situation was perceived by Saudi officials as representing a threat to the country's national security (e.g., wheat embargo) and weakening its bargaining positions, especially with regard to oil prices (Parker, 1989; Looney, 1990).

Table 5.5 The Relationship Between Wheat Subsidies and Area Under Wheat Cultivation 1978-1987

	B	Beta	T.statistics	T.sig.
Wheat Subsidies	.003	.976	12.610	.000
(Constant)	1.844		40.134	.000
R^2	.952		F.Statistic	159.007
N	10		F.Significance	.000
Durbin-Watson Test	2.455			
Dependent variable	log(Wheat area)			

Note: Wheat area in thousand ha. Wheat subsidies in million SR. (Again the wheat area was transformed using the log transformation to relax the regression assumption).

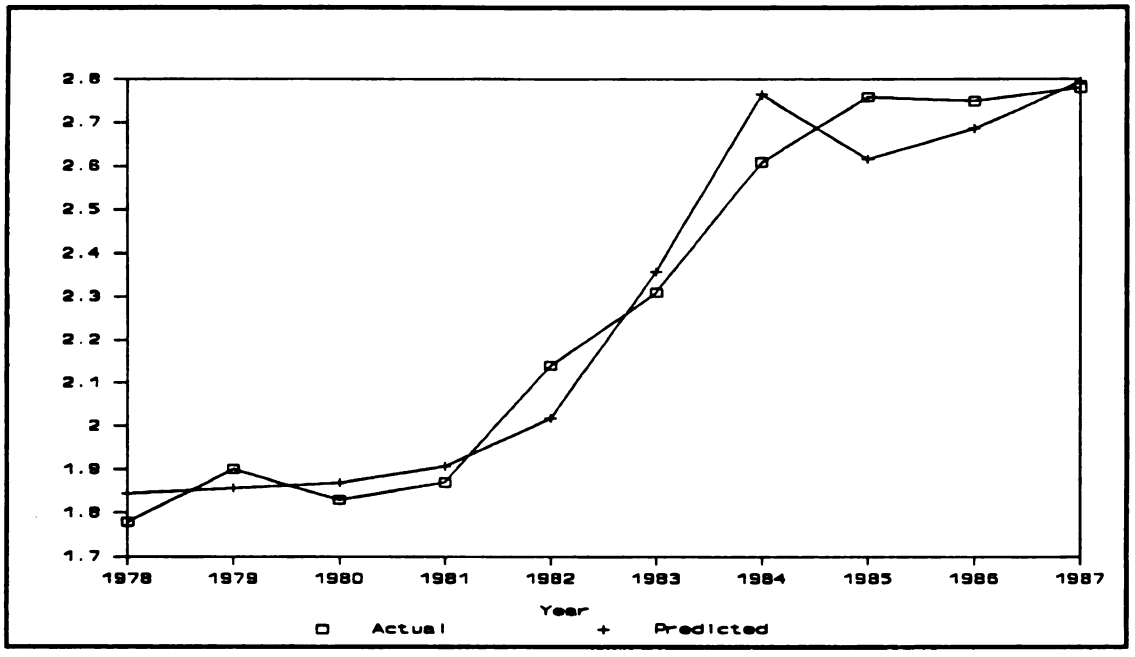

Figure 5.2 Log Wheat Area, Actual and Estimated by a Model Including Wheat Subsidies.

Self-Sufficiency

Despite the growth in agricultural production, overall production was not large to produce a genuine self-sufficiency or even a major reduction in many of the agricultural commodities. By 1986 the country had reached self-sufficiency and even began exporting wheat and eggs (SAMA, 1986). In addition, the ratio of domestic production to total consumption improved substantially for some agricultural commodities. Between 1982 and 1985 the ratio for meat increased from 21.8 % to 51.5 % (SAMA,1986, 1987). But the ratio declined for other commodities. For example, for milk decreased from 50.0 % to 28.7 % (SAMA, 1986, 1987); millet declined from 71.0 to 48.0 % for the same period (Al-monif, 1988). Although the country became a net exporter of wheat, its import of wheat seeds increased rapidly averaging at about 150,000 tons annually (Parker, 1989).

In fact, despite the improvements in local food production, food imports remained a major burden on the country's foreign trade bill. As Table 5.6 shows, the country has been suffering from a severe deficit in its food trade balance since 1971. The food deficit reached its peak in 1984 when food imports exceeded food exports by more than 18 billion SR. The share of food in the country import bill steadily declined from 29.0 % in 1971 to 10.4 % in 1977; since

1978 it began to fluctuate with an overall tendency of increment until it reached 16.1 % in 1988. The food deficit in 1988 was still more than ten times that of 1971.

This represent only the cost of imported food. If the cost of imported agricultural requirements such as machines and fertilizers were included the cost would be even higher. For example, the cost of agricultural machinery imports increased from US$ 5.1 million in 1970 (FAO,1976) to about US$ 384.3 million in 1983 (FAO,1984).

The large quantity of food imports was mainly demand-driven and an obvious indication of the lag of the domestic production to meet the demands for food (e.g.,Looney, 1990). But it should be indicated that since 1970, demands for food have been rising rapidly. Many major factors contributed to this rapid growth. Among these factors was the increase in the country's population in addition to the rise in the number of expatriates, who came to participate in the building of the country's infrastructures and related development, bringing with them different tastes and needs for various food components (Aziz, 1986). The country's population grew from 6,198 thousand in 1970 (FAO, 1979) to 13,078 thousand in 1988 (FAO, 1989). The number of foreign labor, "guest workers," (excluding their dependents) increased from 60 thousand in 1963 (Birks & Sinclair, 1980:164) to 2,660 thousand in 1984 (Fourth Development Plan, 1985-90:36).

Table 5.6 Food Trade Balance 1971-1988 (Million SR)

Year	Food Imports	Food Exports	Food Trade Balance Exports-Imports	Food Share in Total Imports (%)
1971	1096.9	11.3	-1085.6	29.9
1972	1221.6	18.8	-1202.8	25.9
1973	1685.0	33.5	-1651.5	23.4
1974	2023.4	141.0	-1882.4	20.0
1975	2300.9	90.3	-2210.6	15.5
1976	3535.6	85.2	-3450.4	11.5
1977	5361.3	65.2	-5296.1	10.4
1978	7801.2	87.8	-7713.4	11.3
1979	10511.3	161.4	-10349.9	12.8
1980	14192.1	355.8	-13836.3	14.1
1981	17278.2	388.7	-16889.5	14.5
1982	18154.7	356.0	-17798.7	13.0
1983	16585.6	293.7	-16291.9	12.3
1984	18738.8	316.1	-18422.7	15.8
1985	12895.0	398.4	-12496.6	15.1
1986	11914.8	746.4	-11168.4	16.8
1987	12899.8	994.1	-11905.7	17.1
1988	13101.9	1388.3	-11713.6	16.1

Source: Calculated from Ministry of Finance and National Economy, Statistical Yearbook 1974-1989.

Another major factor was the growth of income, particularly since the rise in oil revenues in 1974, and the subsequent improvement in the standard of living and food consumption.

Food consumption pattern witnessed a drastic change during the last two decades. The content of the dietary system underwent both qualitative as well as quantitative changes. As Table 5.7 indicates, individual consumption of basic food elements significantly increased. The individual average food

Table 5.7 Average Per Caput Consumption of Food Between 1974 and 1986 (Calory Per Day)

Food Elements	1974-76	1977-79	1980-82	1983-86
Cereals	926	1176	1212	1219.6
Potatoes & Tubers	9	11	17	18.1
Pulses	18	25	36	40.9
Sugars	184	192	391	319.5
Nuts	20	31	40	25.8
Vegetables	45	51	55	75.1
Fruit	282	326	314	324.3
Meat	100	144	190	283.8
Fish	8	13	18	20.7
Eggs	10	14	24	36.5
Dairy Produce and Milk	98	157	183	192.1
Oil & Fats	92	227	341	401.6
Other	13	34	46	53.9
Total Vegetables Origins	1565	2038	2409	2423.0
Animals Origins	242	361	458	588.9
Grand Total	1807	2399	2867	3011.9

Source: MAW, Saudi Arabian Food Balance Sheets, VOL. 2, (1974-76 to 1983-86).

intake increased from 1,807 calories per day between 1974-1976 to 3,011.9 calories per day between 1983-86. This represents an increment of about sixty seven percent in ten years period or an average of 6.7 % of annual growth.

One other cardinal factor behind the increase in food imports was the sizeable subsidies paid to imported food in order to stabilize and lower their prices for the general population. In 1973, for example, food subsidies amounted to 300 million SR or about 65.2 % of the total government

subsidies. In the same year agricultural subsidies totaled 11 million SR or about 2.4 % of the total subsidies. Although agricultural subsidies outstripped food subsidies in the

Table 5.8 Comparison Between Food Imports Subsidies and Agricultural Subsidies 1973-1987 (million SR)

Year	Food Subsidies		Agricultural Subsidies	
	Amount	% of Total Subsidies	Amount	% of Total Subsidies
1973	300.9	65.2	11.0	2.4
1974	750.0	62.6	69.0	5.8
1975	700.0	45.1	333.1	21.5
1976	600.0	27.9	603.0	28.0
1977	700.0	24.7	772.0	27.3
1978	800.0	23.6	878.7	25.9
1979	1450.0	35.8	633.8	15.6
1980	3000.0	44.8	856.6	12.8
1981	5000.0	43.8	1360.1	11.9
1982	4150.0	35.2	2107.9	17.9
1983	1614.0	15.4	2898.9	27.6
1984	2633.0	21.1	4740.8	37.7
1985	1950.0	21.2	3815.2	39.5
1986	1863.9	21.3	3480.8	39.7
1987	2687.0	32.4	3739.5	45.0

Source: Ministry of Planning, 1990; Al-hababi, 1989. Percentages are calculated by the author.

recent years, food subsidies remained relatively high. In 1987 they amounted to 2,687 million SR or about 32.4 % of the total subsidies (Table 5.8).

Examining the relationship between food imports and the subsidies paid to such imports, the results suggest the existence of a rather significant relationship between the two

issues (Table 5.9). In fact, these subsidies explain more than eighty percent of the variation in food imports (R^2 = .833). As Figure 5.3 indicates, values estimated by the model (the subsidies) closely approach the actual ones.

Table 5.9 The relationship Between Food Imports Subsidies and Food Imports (1971-1987)

	B	Beta	T.Stat.	T.Sig.
Log (Food imports subsidies)	89.734	.913	8.061	.000
(Constant)	-186.625		-5.287	.000
R^2	.833			
N	17	F.Statistic		64.985
		F.Significance		.000
Durbin-Watson Test	1.150			
Dependent variable	Square root of food imports			

Note: Food imports in million SR. Food imports subsidies in million SR. ("Food imports subsidies" was transformed using log transformation and "food imports" was transformed using the square root transformation to relax the regression assumption).

Imported foodstuffs in most of the cases were cheaper (partly because of the subsidies), better in quality and enjoyed marketing advantages because of improved packaging which made them easier to handle and ship (Tuncalp and Yavas, 1983).

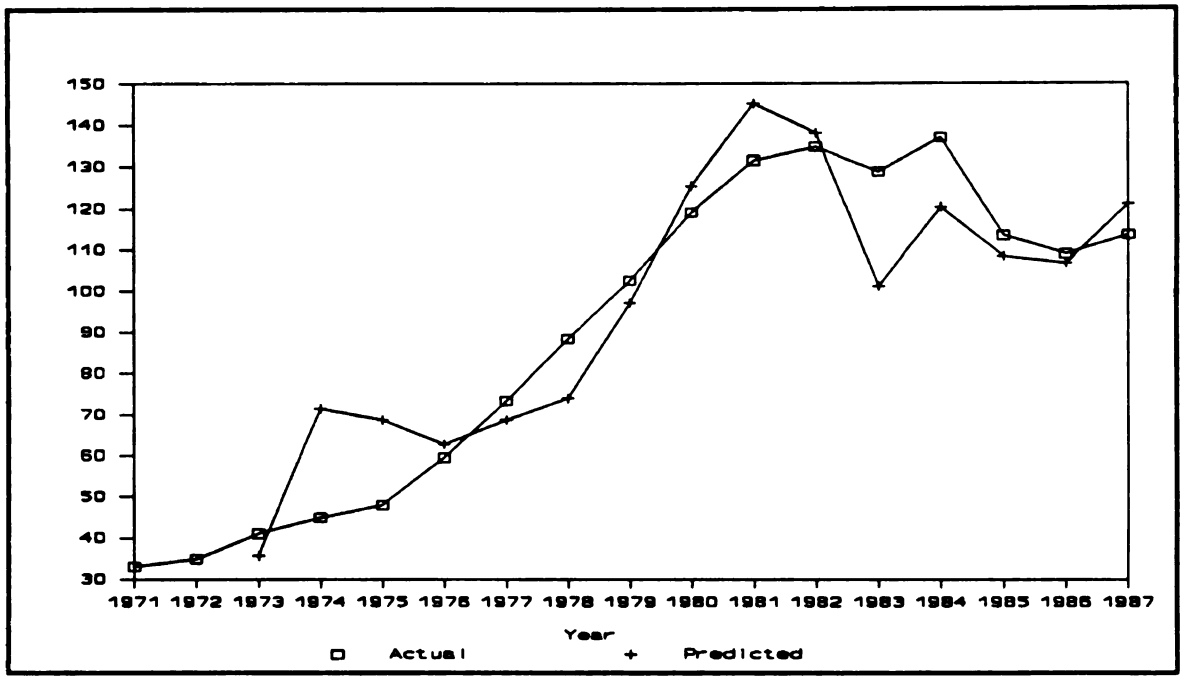

Figure 5.3 Log food Imports, Actual and Estimated by a Model Which Includes Food Imports Subsidies.

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These factors made imported food more successful when competing for the local market. For instance, it was found that many of the local dairy farms were operating below capacity. The owners said that they could not compete with foreign imports and demanded government protection for their infant industry (Ibid).

In this regard, therefore, subsidies to food imports not only hampered local production but also undermined and contradicted agricultural subsidies designed to stimulate agricultural growth.

Agricultural Mechanization

Agricultural support program, subsidies and loans largely contributed to the increase of machine use in agriculture. As Table 5.10 indicates, between 1970 and 1988 the number of agricultural machines made available to farmers by SAAB's subsidized loans amounted to 164,661 engines, 137,984 pumps, 44,222 tractors (both track and 4-wheel tractors), 4,390 harvesters (both combined and forage harvesters) and 211,435 other machines and accessories (balers, ploughs, shovels, drills, leveling coulters, blades, pivot irrigation equipments, sowing machines, threshers, trailers ...etc.).

However, several problems and constraints accompanied the expansion of the use of machines, therefore undermining the

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return of its utilization. Machines in Saudi agriculture tended to be under utilized and have a short life. A study conducted by SAAB (SAAB, 1981) on 168 farms found that the average life was 2.8 years for a track tractor , 2.77 years for a 4-wheel tractor , 2.9 years for a harvester, 2.2 years for an engine and 2.9 years for a pump (SAAB, 1981).

Although the average life of machines tended to improve as the size of farms increased, it remained short. In another study by SAAB on 1,218 holdings, the average life of an engine

Table 5.10 Agricultural Machinery Made Available To Farmers Through SAAB's Subsidized Loans 1970-1988

Year	Engine	Pump	Tractor	Harvester	Other
1970	1266	674	20	0	0
1971	1196	755	19	0	0
1972	1463	792	70	0	0
1973	1635	1063	152	0	0
1974	6703	4810	501	57	567
1975	7450	4574	1006	86	950
1976	7739	5548	1049	168	2195
1977	10383	7336	1449	144	357
1978	11339	9440	2497	000	7161
1979	8866	8108	2265	315	9354
1980	22697	19683	5242	839	23897
1981	20156	17059	5616	123	25837
1982	21855	18858	6629	519	34947
1983	14408	12841	5240	540	30921
1984	10475	9631	3983	620	21717
1985	6071	5936	3007	262	17847
1986	5037	4935	2339	356	15856
1987	3373	3346	1738	208	11621
1988	2549	2595	1400	153	8208
Total	164661	137984	44222	4390	211435

Source: Calculated from SAAB, SAAB in Twenty Years; Annual Report 1985-1988.

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was found to be 2.2 years in holdings from one to one thousand donum in size, while it was 2.6 years in holding of more than one thousand donum in size. Similarly, the average life of a pump and other machinery were found to be 1.8 and 1.4 years in holdings of less than one hundred donum but 2.5 and 2.5 years in farms of more than one thousand donum in size respectively (SAAB, 1982).

SAAB's 1981 study detected growing complaints by farmers from agricultural machinery because of recurrent defections and the inability to use them efficiently. The study attributed this case to: 1) the low awareness of the farmers on how to use and maintain the machinery and the absence of qualified extension services to help them in this regard, and 2) the insufficient supplies of spare parts and the scarce availability of maintenance services in addition to the high cost of repairs in the farmers areas. For example, seventy percent of the farmers (n=168) were found to have not enough access to spare parts in their areas (SAAB, 1981).

Part of this inefficient use of machines was due to the fact that on small farms machines were mostly operated at half capacity. The average area served by each pump and engine amounted to 25.6 and 25 ha. respectively, when each pump could have served between 49 and 52 ha. and each engine could have served between 42 and 52 ha. if used efficiently (Riyadh Chamber of Commerce and Industry, 1990).

This inefficient use of machines played a fundamental

role in increasing the cost of production instead of decreasing it. The value of agricultural production for each one hundred SR invested in agricultural machinery declined from 3,305 SR in 1977 to 1,208 SR in 1980 (Ibid).

The agricultural support program contributed to this inefficient use of agricultural machinery. According to the Fourth Development Plan (1985-90), subsidies to agricultural machinery were encouraging an "excessive use of new machinery" and, at the same time, acting " as disincentive to the maintenance of existing equipment, thus favoring further imports of machinery at the expense of local repair and maintenance activities" (Ministry of Planning, Fourth Development Plan 1985-90: 191).

Agricultural Concentration

With regard to the social objective seeking to improve the welfare of farmers and other rural people, the outcomes lent little support. The major beneficiaries of the agricultural support program and agricultural development in general have been a few capital-intensive farms rather than the small farmers. As indicated in the previous chapter, it is becoming clear that more and more of Saudi agriculture, whether land or production, is increasingly concentrated in the hands of a few large holders (holdings more than one hundred ha.). In 1982, for example, they constituted only about 1.4 % of the total holders but controlled 47.0 % of the

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total agricultural lands (Chapter IV).

In terms of production, it was found that in 1987 seven share-holder companies accounted for 9.8 % of the total wheat production, seventy eight percent of total barley production, eleven percent of total milk production and 10.1 % of total potatoes production. One of these seven companies alone accounted for 31.1 % of total fish production in the same year (Riyadh Chamber of Commerce and Industry, 1990b).

Wheat crop in particular is becoming a profitable business and therefore is dominated increasingly by a few large- scale farms. As Table 5.11 exhibits, some large-scale farms, often referred to as "agricultural projects," controlled a large portion of both wheat area and production. For example, in 1987, 687 agricultural projects accounted for fifty one percent of wheat area and 58.3 % of its production.

Table 5.11 Agricultural Projects Share in Wheat Area and Production

Year	No. of Projects	Areas (1,000 ha.)	% of Total	Production (1,000 ton)	% of Total
1982	48	16.4	12.0	58.6	14.2
1983	101	42.4	20.9	187.5	29.8
1984	129	116.2	28.8	496.1	35.4
1985	192	211.9	36.8	919.7	44.9
1986	374	271.6	48.0	1352.0	59.0
1987	687	306.7	51.0	1543.9	58.3
1988	808	339.1	47.3	1636.6	51.3

Source: MAW, Annual Bulletin of Complete Enumeration of Specialized Farms 1984-1985; Agricultural Statistical Yearbook, 1988. Percentages are calculated by the author.

The concentration on wheat crop was found to intensify as the farm size expanded (SAAB, 1982). Aside from the attractiveness of wheat subsidies, the tendency of large farms to wheat concentration had an economic justification. Wheat production costs diminished while its revenues increased as the area under cultivation increased. A study conducted by SAAB (1981) found that the average production cost was 6,830.6 SR per ha. in projects with areas less than 150 ha.; it was 6,533.6 SR in projects of more than 150 ha. Average revenue was 11,878.8 per ha. in the first category, and 13,496.6 SR per ha. in the second, difference of 1,617.8 SR per ha. Similarly, a monotonic relationship was found between hectare yield and area under wheat cultivation. The average hectare yield was 3.23 tons in the first category, and 3.87 tons in the second.

Agricultural policies during the last two decades played a major role in agricultural concentration. Land distribution, for example, tilted toward and helped to create some of these large scale farms. As Table 5.12 illustrates, by the end of 1988, twelve companies constituted a small fraction of the total beneficiaries (0.02 %) received 20.94 % of the total distributed lands. Similarly, 5,175 agricultural projects representing only eight percent of the total beneficiaries received 49.51 % of the total distributed lands. In other words, about eight percent of the total beneficiaries were given 70.49 % of the total distributed areas, while 59,482 or

91.98 % of the total beneficiaries received only 29.51 % of the total distributed areas.

Table 5.12 Distributed Lands Until the End of 1988 Classified by Type of Beneficiaries

Beneficiaries	No.	%	Area (ha.)	%	Average
Individuals	59482	91.98	366172	29.51	6.2
Projects	5175	8.00	614927	49.55	118.8
Companies	12	0.02	259934	20.94	21661.2

Source: Calculated from Table 4.4 (Chapter Four).

Agricultural loans contributed to this process as well. Of SAAB's total loans between 1964 and the end of 1988 amounting to about 23,101 million SR, 5,667 million SR or about 24.5 % were devoted solely to finance these agricultural projects (SAAB, SAAB in Twenty Years; Annual Report 1985- 1988). These loans helped in the establishment of 4,394 agricultural projects, 1,586 of them were in operation by end of 1988 (SAAB, 1988). This means that on average the government had spent about 1,289.6 thousands SR for each project.

The expansion in the number of the large scale agricultural projects and farms was strongly encouraged by the third development plan for a perceived factor of "efficiency"

in terms of minimizing cost while increasing production (Ministry of Planning, Third Development Plan,1980-1985). In fact, the fourth development plan hailed such a policy, characterizing it as a major success and achievement of the third plan, therefore recommending the pursuit of such a policy.

Although this might accord with the economic objective, it has a shaky social ground. It was found that most of these capital-intensive large farms belonged to investors (mostly merchants) from the cities and mainly relied on foreign labor to perform the work (e.g., Searight, 1986 ; Al-monif, 1988; Altorki and Cole,1989). Therefore, much of the support program benefits will be captured by these large farms before they "trickle down" to the people it intend to benefit. In this regard, agricultural policy, by encouraging the expansion of these large farms, undermined the social objective of improving the welfare of farmers and rural people and traded it for some perceived economic gains.

Agricultural Labor

The composition of foreign labor in Saudi agriculture rapidly increased during the last decades. The employment of foreign labor in agriculture increased from 54,900 or about 9.4 % in 1974/75 to 177,935 or about 26.2 % in 1981/82. In fact, while the non-Saudi workers increased by 224.1 % in this

period, the Saudi workers declined by 5.3 % (Table 5.13).

This increment of foreign labor in agriculture was mainly through the contribution of large farms. By examining the 1981-82 agricultural census, the researcher found that while foreign labor constituted 24.9 % of total employment in farms of less than one hundred ha., the percentage was 74.9 in farms larger than one hundred ha. These findings agree with the

Table 5.13 Number and Percent of Saudi and Non-Saudi Labor in Agriculture 1974/75 and 1981/82.

	1974/75 (a)		1981/82 (b)		Change
	No.	%	No.	%	%
Saudi	530650	90.6	502369	73.8	- 5.3
Non-Saudi	54900	9.4	177935	26.2	+224.1
Total	585550	100.0	680304	100.0	+ 16.2

Source: (a) Birks and Sinclair, 1980. (b) MAW, The General Findings of the Agricultural Comprehensive Census 1981-82. Percentages are calculated by the author.

findings from Altorki and Cole (1989). They found that in a large capital-intensive farm in Unayzah (the farm covered an area of 19,200 ha., about 6,901 ha. of it were under wheat cultivation), of the 86 persons employed by the farm, only two (or 2.3%) were Saudis, while the remaining were expatriates from Egypt,Pakistan and Philippines.

In light of these findings, one finds it difficult not to

concur with Joffe's (1985) conclusion that "Few among the rural labor force have benefitted from the spurt in agriculture production, since it is capital intensive and heavily dependent on foreign expertise" (p.212).

Furthermore, the increment of foreign labor in Saudi agriculture will have a major setback for agriculture development. Foreign labor in many cases is unfamiliar with traditional Saudi crops (e.g., dates), environment (soil and weather) and modern farming methods employed by these capital intensive farms (e.g., Altorki and Cole,1989; Looney,1990). In addition, due to social adjustment problems and the high cost of living, the turnover rate among foreign labor is very high which adds more cost to agriculture (Looney,1990).

Conclusion

It is clear from the previous discussion that the agricultural support program played a vital role in agricultural growth during the last decades. However, the main contributors to and beneficiaries from this growth have been a few capital-intensive large farms utilizing foreign labor and management. The traditional farmers and labor forces have benefitted less (Joffe, 1985). In addition, billions of SR in subsidies and loans were poured into agriculture to

stimulate such a growth. Therefore, unlike most of the successful situations in developing countries where agriculture expands to meet the growing demand for food, Saudi agriculture seems to be mainly "supply driven, and based on cost-reducing government programs" (Looney, 1990:98).

One basic goal of agriculture development has been to diversify the economy and reduce dependency on oil as a non-renewable and depletable resource (e.g.,Fourth Development Plan, 1985-1990). Yet, oil revenue has been the main source (if not the only source) of capital to keep the agricultural support program alive (e.g.,Looney, 1990). This is a rather critical issue in Saudi agriculture. If agriculture is largely dependent on the government support program and this support program in turn relies on oil revenue, it follows that agriculture is largely dependent on oil. In other words, the future of agriculture is mainly intertwined and interlocked with the future of oil.

This important issue will be the subject of discussion in the next chapter. The discussion will examine the linkages between oil and agriculture and how these linkages relate to the future of the agricultural support program and agriculture in general, especially in an era of an unstable oil economy.

Chapter VI

The Future of Saudi Rural and Agricultural Sector

Introduction

This chapter discusses the prospect of Saudi rural and agricultural sector particularly in relationship to the support program policy discussed earlier. The discussion focuses on three major issues: (1) linkages between oil and agricultural support program, and their implications on agriculture given the previously established relationship between this support program and agricultural growth; (2) the reciprocal relationship between agricultural expansion and available water supplies; and (3) the emerging new structure in agriculture and its implications.

Oil and Agricultural Support Program:

Examining the relationship between oil revenues and agricultural support program revealed the existence of a strong association between oil revenues and the amount of loans extended to agriculture. In fact, "oil revenues have been more instrumental in increasing agricultural credit than government expenditure" (Looney, 1990:107).

From Chapter IV, it was clear that loans to agriculture dramatically increased after 1973, coinciding with an increase

in oil revenues (see Table 6.1). When oil revenues began declining after 1981, loans to agriculture were scaled back. Loans to agriculture declined from a peak of 4,166 million SR in 1982 to 841.3 million SR in 1987 (Table 6.1).

The case with agricultural subsidies was somewhat different. Most agricultural subsidies, introduced after 1973, increased rapidly like agricultural loans. However, declining oil revenues after 1981 had little impact on the amount of agricultural subsidies. Although wheat subsidies were reduced from 3.5 SR/k.g to 2.0 SR/k.g since 1986, the total amount of subsidies provided to agriculture increased in the same period. Agricultural subsidies increased from 2,107.9 million SR in 1982 to 3,739.5 million SR in 1987 (Table 6.1).

The reason why subsidies did not suffer a major reduction like loans lies in their nature. Subsidies became institutionalized to the degree that farmers became dependent on them. And " Once the subsidies became a part of the system, it is difficult to remove them" (ElMallakh, 1982:95).

When the government attempted to reduce agricultural subsidies, particularly the price guarantee paid to wheat producers, "a very influential farm lobby," consisting largely of big agricultural projects and companies, emerged to oppose further reductions (Looney, 1988:241).

Because the strong linkage between oil and agricultural credit, which was a major driving force behind the recent

Table 6.1 Oil Revenues and Agricultural Loans and Subsidies 1970-1987 (Million SR)

Year	Oil Revenues (a)	Agricultural Loans (b)	Agricultural Subsidies (c)
1970	7122	16.6	0.0
1971	9685	16.6	0.0
1972	13480	19.6	4.0
1973	39516	36.3	11.0
1974	94190	145.5	69.0
1975	93481	269.4	333.1
1976	121191	489.8	603.0
1977	114042	585.7	772.0
1978	115078	709.1	878.7
1979	189295	1128.7	633.8
1980	319305	2530.9	856.1
1981	328594	2932.9	1360.1
1982	186006	4166.0	2107.9
1983	145123	3495.8	2898.9
1984	121348	2321.8	4740.8
1985	88425	1551.2	3815.2
1986	42464	1019.2	3480.8
1987	67405	841.3	3739.9

Source: (a) Ministry of Planning, 1990: 206.
(b) Table 4.2, (c) Table 4.3 (Chapter IV).

agricultural growth, there may be a certain level of agricultural dependency on oil. In other words, oil was the mechanism by which the recent growth in agriculture was made possible. This in turn implies that agriculture is becoming subject to the vagary of the oil economy, which may have long-term dire consequences on agriculture, not only because of oil market fluctuations but more importantly because oil is a depletable, non-renewable resource.

In the near future, loans and subsidies to agriculture

are expected to maintain a level similar to that of the Fourth Development Plan (1985-1990). The Fifth Development Plan (1990-1995) intends to extend 6,900 million SR in short- and medium- term agricultural loans during the plan's period. This is equivalent to an annual average of 1,380 million SR.

Similarly, the fifth plan projects agricultural subsidies will continue along parameters adopted during the fourth plan. As Table 6.2 indicates, MAW alone will provide a total of 1,760 million SR in subsidies to dates, cereals (millet, barley, rice and sorghum) and chemical fertilizers during the fifth plan period. These subsidies are expected to increase from 295 million in 1990 to 405 million SR by 1994.

Table 6.2 Subsidies to Some Agricultural Activities During The Fifth Development Plan (1990-1995) (Million SR)

Commodity	1990	1991	1992	1993	1994
Dates & Palm Offshoots	110	115	120	125	130
Cereals (barely, rice sorghum and Millet)	25	30	35	40	45
Chemical Fertilizer	160	180	200	220	230
Total	295	325	355	380	405

Source: MAW, Fifth Plan, 1990-95 (Agricultural Sector).

Only the subsidies which will be provided directly through MAW are represented. They do not include subsidies

extended to agricultural machinery through SAAB or GSFMO subsidies to wheat. When referring to wheat subsidies, the minister of Saudi agriculture stated plainly that the government did not plan to terminate or further reduce wheat subsidies in the foreseeable future.

> We do not intend to remove the subsidies simply because we aim at sustaining high levels of farmer income from the crop so that the resulting resources can be channeled within the sector toward further product and crop diversification and to protect our producers against the extravagant support policies in existence worldwide (Al-shaikh,1988:8).

The persistence in providing agricultural credits and subsidies is likely to be accompanied by an improvement in local food production. The fifth plan anticipates a considerable growth in agricultural production during its period, 1990-1994. Yet, in spite of this expected growth, local production is expected to fall short of reaching self-sufficiency in many major food elements. As Table 6.3 illustrates, the expected increase in local food production will be offset by rising demands for food. Except for wheat and eggs where some surplus for export may occur, the gap between the demand for food and supplies from local production will continue to be filled by food imports.

Table 6.3 Estimated Demands and Projected Local Supplies for The Major Food Commodities in 1994 (Thousand Tons)

Commodity	Estimated Demands (A)	Projected Local Production (B)	Difference B-A *
Wheat	1291	2600	+ 1309
Read Meat	297	216	- 81
White Meat	586	436	- 150
Egg	144	150	+ 6
Milk	770	583	- 187
Vegetables	1569	1261	- 308
Fruit	1491	1103	- 388
Fish	111	84	- 27

Source: Ministry of Planning, Fifth Development Plan, 1990-1995. * Calculated by the author.

Water and Agriculture:

The uncertainty of oil's future is not the only problem facing Saudi agriculture. Another major constraint is water availability. The recent expansion in agriculture brought about by this support program accelerated the drain on water, a precious commodity in an arid country like Saudi Arabia.

Water consumption increased from 2,360 million cubic meters in 1979 to 16,230 million cubic meters in 1989. This increment was largely the contribution of agriculture. Agricultural consumption of water increased from 1,850 million cubic meters or 78.4 % of total water consumption in 1979 to

14,580 million cubic meters or 89.8% of total water consumption in 1989 (Table 6.4).

Major water supplies came from non-renewable underground aquifers. Consumption of this resource increased from 1,170 million cubic meters or 49.6% of the total water supplies in 1979 to 13,480 million cubic meters or 83.1 % of the total supplies in 1989. This reliance on underground non-renewable resources poses a major threat to the country's future supplies of water and jeopardizes agriculture's future as well as the country as a whole.

The proven underground non-renewable water supplies amount to 500,000 million cubic meters (Fourth Development Plan 1985-1990:135). Given the rate of consumption of this vital resource in 1989 (which amounted to 13,480 million cubic meters), this major water supply could be exhausted in about thirty seven years.

Forty years ago, following introduction of mechanization to Saudi agriculture ten years before, Douglas (1951) foresaw and pointed to this potential dangerous consequence:

> The critical and most frightening aspect of the expansion of agriculture in Saudi Arabia is the relationship between mechanical power and the potential water supply. The development of mass agricultural production creates a vastly increased demand for water- the vital resource. At AlKarj and other localities an enormous amount of power has recently been applied to obtaining water from the ground, and already ground- water levels have sunk. The difference between digging a well with a power-operated drilling rig and digging it by hand is obvious. So is the

difference between a diesel-driven pump delivering a thousand gallons of water a minute and a donkey well delivering two or three (p.383).

Table 6.4 National Water Resources- Demand Balance (Million Cubic Meter)

	1979	1984	1989	1994 *
Demands				
Agriculture	1850	7400	14580	12675
Domestic & Industrial	510	1200	1650	2200
Total	2360	8600	16230	14875
Resources				
Surface & Renewable	1140	1850	2100	2200
Non-renewable	1170	6320	13480	11545
Desalinated Seawater	50	330	540	840
Reclaimed Wastewater	00	100	110	290
Total	2360	8600	16230	14875

Source: Ministry of Planning, Fifth Development Plan 1990-1995: 218,222. * Plan's projection.

The threatening shortage of water supplies, although a serious concern, is not the only problem associated with the expansion in the use of underground water. " Aquifers water increases in salinity as it is drown down" (Tuncalp and Yavas, 1983:341). The rise in salinity not only increases the cost of water treatment to make the water suitable for human

consumption but also is a major setback to agricultural use. Increased salinity leads to a decline in crop yields even in high salt-tolerance crops such as date palms and alfalfa (Ebert,1965).

The expansion of agricultural consumption of water exceeded the third plan's projection by about four times (Fourth Development Plan 1985-1990). This increment in agricultural consumption of water (mostly underground non-renewable) was due largely to the expansion of wheat cultivation. In 1984, for example, wheat alone accounted for 37.5 % of total water consumed in agriculture (Ibid).

The fourth plan recognized this accelerated depletion of underground water and cautioned that " some areas of the Kingdom could face critical water shortages in the near future unless conservation measures are introduced to control the over-exploitation of finite reserves" (Ibid:60). Nevertheless, as indicated previously, consumption of underground water during the fourth plan increased dramatically.

As Table 6.4 illustrates, the Fifth Development Plan (1990-1995) projected a decline in water consumption from 16,230 million cubic meters in 1989 (end of fourth plan) to 14,875 million cubic meters in 1994 (end of fifth plan). This saving will come from a reduction in agricultural consumption of water from 14,580 million cubic meters to 12,675 million cubic meters in such a period. This reduction will be achieved, the plan argued, through the use of more water-

saving methods in agriculture, such as the use of greenhouses and irrigation by dripping method to reduce evaporation amounts. The plan anticipated a major cut in the use of fossil water while the contributions of surface and renewable water, reclaimed wastewater and desalinated seawater were expected to increase.

The outcomes of these projections, however, remain to be seen. In the meantime, it must be noted that even the fourth plan regarded desalination as a non-viable alternative, especially in the near future. Desalination is costly both in terms of energy and capital (Beaumont,1977). Increasing reliance on desalinated water may pose a threat to the country's security in the future, not only because the country may not be able to afford high energy and capital costs but also because of the increasing dependency on the associated technology.

The shortfall in water table will add more costs to agriculture. An increasing amount of capital will be required to invest in more powerful machines for drilling and water pumping. This might result in more and more small farmers leaving agriculture. Their traditional wells will become insufficient to supply their farms with water and their financial positions may not permit them to acquire these costly machines to reach the sinking water (Lackner, 1978). This will have a profound impact on the structure of agriculture. Some traditional farms, perhaps entire oases may

collapse. When referring to such a potential consequence, Lackner (1978:187) argued that " the traditional communities, and probably their socio-economic structures, are disappearing; even with the best will in the world and unlimited cash, it will not be possible to recreate them once the fundamental ecological structures of the oases have been undermined".

The fact that both oil and fossil water, on which the recent "development" in agriculture depends are depletable and non-renewable resources, raises a serious question about the future of this type of development. According to the ecological approach, "agricultural sustainability depends on the availability of renewable resource base and control of demands on its output that will insure against its depletion" (Doglass, 1985:14). In this regard, the maintenance of the type of agricultural expansion and growth currently taking place in Saudi Arabia is rather difficult if not doubtful. This issue was acknowledged by the Saudi Minister of agriculture who stated that " our new challenge is in sustaining the achievement of the past decade, which is even more difficult than attaining them. Maintaining success requires the same inputs and the same drives as those applied in achieving it" (Al-shaikh, 1988:11).

As pointed out in Chapter IV, one major goal of government expenditure on agriculture has been to improve agriculture to contribute more in the national economy in

order to decrease dependency on oil. But if agricultural development is conditioned and dependent on government financial support which in turn is dependent on oil, then little has been achieved toward diversification. If agriculture is becoming more dependent on oil, a depletable resource, then the country is not facing one danger but multiple dangers. If oil has become the means both to import and locally produce food, then future generations will suffer when the oil is gone or became obsolete.

Current oil revenues may enable the present generation to import food and other commodities needed for survival (or even comfortable living), but when the days of oil are over, many people may have no alternative but to return to the activities by which their ancestors survived, oases agriculture and herding. At that time, when water is gone too, the situation will become more difficult.

Today the petrodollar brings into Saudi Arabia the most sophisticated machines from all over the world, provided there are no embargoes or limitations on technology transfer, to dig for and pump water. Tomorrow, when the oil runs out, the case will be totally different unless such a machine is produced locally- which, given the present situation, is slim at best. But even if people some-how managed to find access to such a machine, it would be of no value if there was no water to locate.

In a country like Saudi Arabia, where there are no rivers

or lakes, and rain is scarce, water is a precious commodity. Therefore, every possible step to conserve underground water and prolong its life should be firmly taken. Oil revenues must be directed more to investment in research to find ways to preserve and maximize the life of this vital resource than to promote a "relatively inefficient agricultural program" (Looney, 1990 :162).

Both oil and ground water are endowments of the country. Therefore, they must be wisely used if there is a concern about the welfare of future generations. As one analyst argued,

> Saudi Arabia is making an intergenerational choice on the economic benefit every time it spends a riyal of oil income. If it spends it all on nonproductive subsidies, then decision is to rob future generations in favor of the present; and if Saudi Arabia employs subsidies in a distortionary manner, then losses are incurred by present and future generation (Askari, 1990:120).

The Structure of Agriculture:

It is apparent from the previous chapter that the agricultural support program played a major role in agricultural concentrations by stimulating and encouraging expansion of large scale agricultural projects and companies. This growing phenomenon will influence the future structure of Saudi rural and agricultural sector. Expansion of these farms might continue the increase of agricultural production. But

increasing agricultural production is not the sole objective of agricultural development in Saudi Arabia. Agricultural development aspires to improve the welfare of traditional farmers and rural people which in turn tries to reduce rural-urban migration to avoid urban congestion and the associated problems.

If the expansion of these large farms continue along the pattern prevalent in the 1980s, then a growing number of traditional farmers will be increasingly forced out of agriculture or will seek employment on larger farms as wage-laborers (Lackner,1978). Yet, as seen earlier these large farms are mostly dependent on foreign labor.

The participation of non-Saudi workers in Saudi agriculture will increase in the near future. As Table 6.5 shows, during the fifth plan (1990-95) supplies from Saudi labor will exceed projected demands for employment, except in the agricultural sector. Therefore, while the plan argued that it would be necessary to release 220.4 thousands non-Saudi workers in order to accommodate the growing supplies of Saudi labor, in agriculture 36.3 thousand positions (or 52.3 % of the total demands) will be filled by foreign labor.

Table 6.5 Projected Demands for Employment and Expected Supplies from Saudi Labor During The Fifth Development Plan (1990-95) Classified by Occupation (Thousands)

Occupation	Projected Demands	Expected Supplies from Saudi Labor	Difference Demands-Supplies
Professionals & Technicians	81.5	83.6	- 2.1
Administratives	36.5	38.7	- 2.2
Clerks	71.7	129.6	- 57.9
Trade workers	52.0	82.8	- 30.8
Service Workers	-23.9	128.4	- 152.3
Workers in Agriculture Sector	69.4	33.1	36.3
Construction	67.2	78.6	- 11.4
Total	354.4	574.8	- 220.4

Source:Ministry of Planning, Fifth Development Plan (1990-95):177.

Agriculture, therefore, will become largely

> an enclave activity from which the traditional agricultural labor force will be increasingly excluded through its inability to invest and its lack of appropriate skills. The massive subsidies will, therefore, increasingly pass into foreign hands as they alone offer the skills necessary to maintain the sector and the dream of self-sufficiency will merely become another trap for the loss of reserves (Joffe, 1985:224)

Although in the short-term some employment opportunities might open in agriculture, the expansion of mechanization and capital-intensive farms may limit these opportunities. The role of scale and mechanization on declining agricultural

employment is widely acknowledged (e.g., Flinn and Buttel,1980). After reviewing studies in this regard, Berardi (1981:485) concluded that "one of the major direct effects of agricultural mechanization has been labor displacement; as agricultural operations are mechanized the total agricultural work force has decreased".

The expansion of agribusiness is increasingly reshaping both the structure and the map of Saudi agriculture. The structure of agriculture is being divided into two main sectors, somewhat improved small scale farming and capital-intensive large scale farming. These two sectors are classified as "traditional" and "specialized" farms respectively by the Ministry of Agriculture and Water (e.g., MAW, Annual Bulletin of Current Agricultural Statistics 1984-85). The significance of these specialized farms in Saudi agriculture is rapidly increasing. For example, their share of the country's total cultivated area increased rapidly from 3.8 % in 1982 to 16.7 % in 1984 (Table 6.6).

As evidenced in Table 6.6, these specialized farms are largely developing in the eastern, central and northern parts of the country where virgin lands and underground water are available (see water resource map in appendix). While the south-western region once was the main agricultural area of the country in the early 1970s, central region recently increasingly assumed such a position.

The share of the country's south-western region

Table 6.6 Traditional and Specialized Cultivated Areas 1982-84 Classified by the Country's Regions (Area in Donum)

Regions	1982 Area	%	1983 Area	%	1984 Area	%
Eastern						
Traditional	195119	81.6	164466	67.0	163584	68.9
Specialized	43914	18.4	80971	33.0	73855	31.1
Total	239033	100.0	245437	100.0	237439	100.0
Central						
Traditional	2153068	92.4	2493390	87.7	3540078	79.7
Specialized	176033	7.6	349749	12.3	901784	20.3
Total	2329101	100.0	2843139	100.0	4441862	100.0
Northern						
Traditional	365454	98.3	259349	76.5	447138	57.7
Specialized	6321	1.7	79751	23.5	328492	42.3
Total	371775	100.0	339100	100.0	775630	100.0
Western						
Traditional	984017	100.0	1074698	100.0	755991	100.0
Specialized	7	0.0	24	0.0	48	0.0
Total	984024	100.0	1074722	100.0	756039	100.0
South-Western						
Traditional	2045488	100.0	2809899	100.0	1615978	100.0
Specialized	0	0.0	349	0.0	0	0.0
Total	2045488	100.0	2810248	100.0	1615978	100.0
Whole Country						
Traditional	5743146	96.2	6801802	93.0	6522769	83.3
Specialized	226275	3.8	510844	7.0	1304179	16.7
Total	5969421	100.0	7312646	100.0	7826948	100.0

Source: Calculated from MAW, Annual Bulletin of Current Agricultural Statistics 1984-85. See map in Appendix For regions's delineation.

cultivated areas between 1971-75 averaged 57.8 % but declined to only 20.7 % between 1983-87. The central region increased from 18.5 % to 57.8 % for the same periods (Table 6.7). Furthermore, cultivated areas in the south-western region declined during the same period by about 22.4 % , while the central region (as well as the northern and eastern regions) registered a phenomenal growth .

This emerging phenomenon poses a major challenge to the efforts seeking to maintain a regional balance and equality, particularly since the majority of the country's agricultural and rural population reside in the south-western region. In 1982, 49.8 % of the country's total agricultural population (people living on farms) and 44.8 % of the total rural population (people living in villages and hejar, including those on the farms) were located in this region (Table 6.8). In other words, agricultural expansion and growth are taking place in those areas that depend less on agriculture, while in the regions which are largely agricultural-based, agriculture is rapidly deteriorating.

Due to the tendency of studies of Saudi agriculture to focus on economic and physical aspects, and because this process of change and transformation is still in its early stages, there is a paucity of information regarding the social aspects. Therefore, it is rather difficult to determine the full extent of this process's social implications of change, particularly since the full impact of the oil revenues's

Table 6.7 Average Cultivated Area 1971-75 and 1983-87 Classified by the Country's Regions (Area in Thousand ha.)

Regions	1971-75 Area	%	1983-87 Area	%	% Change
Eastern	9.3	2.2	31.3	3.5	+ 236.6
Central	76.3	18.5	516.5	57.8	+ 576.9
Northern	8.7	2.1	82.6	9.2	+ 849.4
Western	79.4	19.3	78.4	8.8	- 1.3
South-Western	238.5	57.9	185.1	20.7	- 22.4
Country Total	412.2	100.0	893.9	100.0	+ 116.9

Source: Calculated from MAW, Bulletin of Agricultural Current Sample Survey From 1970/71-1974/5; Annual Bulletin of Current Agricultural Statistics 1984/5; Agricultural Statistical Yearbook 1988.

Table 6.8 Agricultural and Rural Population in 1974 and 1982 Classified by the Country's Regions

Regions	Agricultural Population (1) 1974 #	%	1982 #	%	Rural Population (2) 1982 #	%
Eastern	93246	7.4	89052	5.7	184511	7.1
Central	179229	14.2	267110	17.3	426733	16.4
Northern	72052	5.7	109508	7.1	167500	6.5
Western	250006	19.7	310649	20.1	656112	25.2
South-Western	670833	53.0	770669	49.8	1164466	44.8
Country	1265366	100.0	1546988	100.0	2599322	100.0

Source: Calculated from MAW, Comprehensive Agricultural Census: The Kingdom Aggregate (VOL.1) 1973-74; The General Findings of The Comprehensive Agricultural Census Based on Agricultural Directorates 1981-82. Ministry of Municipal and Rural Affairs, Socio-Economic Survey of Villages & Hijar in The Kingdom (Fourth Report) 1984. (1) People living in the Farms only. (2) People living in the Villages and Hijar including people living in farms.

decline has not yet penetrated. Nevertheless, some comments regarding the potential human costs can be inferred from the study's findings.

The process of nomadic settlement not only impacted the nomadic mode of production as explained earlier, but also affected nomadic social relations and norms. A nomad, describing the change in his fellow nomads' social life as a result of their settlement, wrote:

> Social relations among the Bedouin declined and weakened, for the Bedouin began to think twice about visiting a friend who now was living in a stone house with a closed door upon which he had to knock for his friend to answer. This knocking at doors is not liked by the Bedouin who does not know what is going on in this house with closed doors-and no one might be at home. This man or that was accustomed to go to his friend's 'house of hair' which was open by day or by night, and he was able to see at a glance who was inside, it being the duty of those in the tent to receive him hospitably whatever the circumstances be.
>
> even if it were a woman in the tent she could perform the duties of entertaining the guest, and the guest could personally slaughter the animal for his meal, as well as preparing Arab coffee himself. These were the traditional ways.
>
> But his friend has now come to live in a closed house, and the Bedouin is shy of sitting with a woman in a closed house like this. In such case the guest would be obliged to go to another house or to go away altogether.
>
> Traditions of hospitality themselves have changed, for, instead of the animals customarily slaughtered in honor of and to entertain the guests, it was at times difficult to obtain these animals and, against his will, the Bedouin had to resort to killing chickens, or buy meat sold in the market. This caused awkwardness and embarrassment to both

> the host and his guest.
>
> Time for gathering together to take coffee, customarily the hours of morning, noon, evening and night, came to an end, for every Bedouin became preoccupied with his own circumstances, his new life and how to organize it (Abu Adhirah, 1983: 209)

Current Saudi agricultural policy, as pointed out previously, has contributed greatly to the expansion of large-scale farming operations. This new development will, on the long run, produce an adverse effect on rural communities.

The relationship between the expansion of large-scale farms and the deterioration of a rural community's well-being is widely acknowledged. For example, in the United States, several studies have found a strong association between the increase of large-scale farming operations and the rise of the number of people dependent on wages, lowered levels of living conditions, a low degree of population stability, a weaker loyalty to the community, a low level of participation in the community's affairs and greater social segregation and social distancing between the different social groups of the community (Goldschmidt, 1978a, 1978b; Green, 1985; Reif, 1987; Hefernan, 1972; Hefernan and Lasely, 1978).

Although it might be too early for these or similar consequences to develop in Saudi Arabia because of the short history of this type of farming, future possibilities can not be ruled out.

Nomadic herding and oases agriculture (traditional agriculture) have enjoyed a long history in Arabia. Through

these two activities, people for centuries have survived the harsh, inhospitable conditions of this arid part of the globe. Certainly it was a rough and difficult life style (compared to the type of life existing today with the flow of petrodallors). Nonetheless, it was more compatible with the ecosystem and life continued for many generations.

Given the fact that ground water is a non-renewable and depletable resource that could be exhausted in about thirty-seven years, this rapid process of nomadic settlement and agricultural expansion began disrupting Saudi Arabia's fragile ecosystem. This will likely yield tragic consequences for the course of human life in that part of the world, particularly since oil is a non-renewable and depletable resource as well.

In fact, an early sign in this direction began to surface. It was reported that there is a growing worry among some farmers (i.e., Al-qaseem area , the central region) about the future of their farming activities because of ground water's decline. They complained that the expansion of large-scale farms is rapidly sinking ground water; that they had to keep reinvesting in more powerful but costly drilling and pumping machines (Al-yamamah, 1989).

If this process continues, many farms, perhaps entire oases, will collapse not only because of financial bankruptcy but more importantly, because of water shortages. Cole (1975) stated that

> One son of an Al-Murrh shaikh, when told

> confidently by a project official that the water supply was certain to be adequate for 100 years, reflected that large-scale settlement at this place would be a very unwise gamble for his tribe--after all, they have managed sufficiently well on their own for several thousand years (Cole, 1975:15).

This statement might be sufficient enough to appreciate the potential human costs of this rapid decrease in ground water, the basis of oases life. If one hundred years of a promised water supply seems unconvincing to a simple nomad to plan the future of his tribe, what can be said about the future of the country's rural community with only thirty-seven years of a ground water supply?

Conclusion

Agricultural expansion is likely to continue at least in the early 1990s because of the government's commitment to maintain the flow of its financial support. This expansion will further improve local production of food, which in turn will lower food imports. Yet, food self-sufficiency will continue to be a pursued objective. Saudi Arabia will maintain self-sufficiency in wheat, a perceived strategic commodity, and will decrease its dependency on the outside world for food supplies. However, the relative decline in the dependency on imported food will largely be replaced by a growing dependency on foreign labor, imported technology and know-how.

Underground water played a major role in the agricultural

expansion and will continue to assume this role. Consequently, a large portion, if not the total reserve of this vital resource, will be lost inevitably.

Many of the agricultural support program benefits and economic gains from this growth will end in the hands of large scale farms, while traditional farmers particularly in the south-western region will be less fortunate. Many small farmers are likely to abandon agriculture and find low-skill jobs in the tertiary sector (Senani,1983).

Because most of these large farms are developing fallow lands of the central, eastern and northern regions, the deserts lands of these areas will become the "bread basket of Saudi Arabia" while the green slopes of the south-western mountains will become recreational resorts rather than the mainstay of clustered agricultural communities.

In the short-term agricultural contributions to the economy may increase but this does not imply a genuine diversification of the economy. After all, agriculture is dependent on oil for the capital supplies to maintain the support program. Given that both oil and underground water, the main momentums behind the recent growth in Saudi agriculture, are depletable and non-renewable resources, the long-term prospect of this growth is rather unclear. In this regard, it may be "optimistic to suggest that Saudi Arabia should plan its post-oil economy on an agricultural basis" (Lackner, 1978:188).

Chapter VII

Summary, Conclusion and Suggestions for Future Research

Summary and Conclusion

This study presented an investigation of the relationship between state and agriculture in Saudi Arabia. The analysis explored the nature of state intervention in agriculture both before and after 1970, and the consequences and ramifications of state involvement on the future of rural and agricultural sector.

Saudi government involvement in its agricultural and rural sector goes back to state's formation in the early 1930s. Before Saudi Arabia became a nation-state in 1932, Arabia was occupied by several independent, often antagonistic, tribes. The tribe combined the political, social, military and economic units in Arabia at that time. The concept of statehood (or even nationhood) did not exist.

Most of these tribes were largely nomadic, depending on spacial mobility for their survival as they followed grass along the rangelands. These characteristics were perceived as obstacles to the development of statehood. Spacial mobility, in particular, was a major challenge the state faced as it attempted to assert its control and implant a sense of national loyalty and identity rather than the more disjointed tribal loyalty and identity.

To overcome these obstacles, a scheme of tribal settlements in hejar around water points was developed by the fledgling state as a major step toward building a nation. The nomads were offered financial assistance and other incentives in order to settle in these hejar. In these settlements the nomads were introduced to the concept of private land ownership which until then was of little value to them.

Although the settlement scheme did not succeed in transforming large portions of the nomads into permanent farmers, it succeeded in transforming mobile nomads into settlers. It assisted them in making the transition and integration into new social and economic structures.

Another equally important step of state intervention in agriculture accompanying the process of nomads' settlement was the abolition of the hema system. The tribes depended on this system to assert their control and unity. The transformation of the hema (previously held by tribe) to public land (under the government control) and the adoption of private ownership marked a turning point in tribal history. It represented a transformation of the previous mode of production. The collective ownership of the land and the responsibility of its protection became obsolete. This process coupled with the increasing assistance and protection provided by the state accelerated the process of tribal disintegration and channeled part of the loyalty of its members to the state. Therefore, although some social objectives (e.g., education, health and

improvement of the nomads standard of living) were part of this settlement process, the underlying objective was a political in nature.

However, Saudi state involvement in agriculture even before 1970 was not confined to the nomad settlement. The government established the Ministry of Agriculture and Water (MAW) and its related organizations, such as the Saudi Arabian Agricultural Bank (SAAB) to carry out and provide assistance for agricultural development. The ministry conducted agriculturally related studies and constructed dams, rural roads and other related projects. Most importantly, it began in 1964 to extend credit to agricultural activities through SAAB. About 69,979 million SR in short-and medium-term loans were extended to farmers between 1964 and 1969. These loans largely assisted small farmers in the process of agricultural mechanization.

With the inception of the first development plan (1970-75) an elaborate strategy for the country's development was initiated and put into practice. Although there were some modifications and changes in the objectives and policies from one agricultural plan to another, the basic guidelines remained largely unchanged. The aims of agricultural development more or less were to increase local food production and to improve the welfare of the farmers and rural people.

The agricultural support program which consisted of

agricultural loans, subsidies and land distribution, was the major component of the agricultural policy designed to achieve these objectives. Between 1972 and 1987 the government provided about 26,253.5 million SR in subsidies to various agricultural activities especially farm machinery. Similarly, between 1970 and 1988 about 23,030.9 million SR in short- and medium-term loans were extended to agriculture, largely for agricultural machinery. Furthermore, between 1970 and 1988 about 1,241,033 ha. of fallow land were distributed to potential farmers.

This support program played a crucial role in agricultural growth and expansion. The number of agricultural holdings increased from 180,670 in 1974 to 212,157 in 1982 and the average size of a holding increased from 6.7 ha. to 10.1 ha. in the same period. Cultivated areas increased from 405 thousand ha. in 1971 to 1,162 thousand ha. in 1988. Between 1970 and 1988 agricultural production increased from 213 to 3,612 thousand tons in the case of cereals, from 141 to 1,987 thousand tons in the case of vegetables, from 307 to 792 thousand tons in the case of fruit, from 43 to 473 thousand tons in the case of meat, from 156 to 498 thousand tons in the case of milk and from 5 to 103 thousand tons of eggs production. The value added in agriculture increased from 1,025 million SR in 1970 to 20,985 million SR in 1988.

However, despite this growth in local food production, a genuine self-sufficiency or even major reduction in food

imports was not achieved except in a few agricultural commodities-- mainly wheat and eggs. In 1988 the country food import bill amounted to 13,101.9 million SR, while the value of its export amounted to only 1,388.3 million SR, resulting in a food deficit of 11,713.6 million SR.

The agricultural support program contributed enormously to the expansion of agricultural mechanization, but simultaneously encouraged the excessive and inefficient use of machines to the degree that mechanization began increasing the cost of production instead of reducing it.

This support program also contributed to crop concentration. Due to the generous subsidies provided to wheat, wheat dominated agricultural areas accounted for as high as 62.1 % of the total cultivated areas during 1980s.

Finally, this support program, by leaning toward the establishment of large scale agricultural enterprises, accelerated the process of agricultural concentration. For example, in 1982 only 1.4 % of the agricultural holders controlled forty seven percent of the agricultural lands. These large scale agricultural farms largely dependent on capital intensive operation and foreign labor. Therefore, many of the benefits from this support program and the gains from agricultural growth largely bypassed the traditional farmers and labor force and hence the process of rural-urban migration continued.

Saudi Arabia adheres to the principal of "private

ownership and free enterprises" (Sharshar,1977:61). This applies to the agricultural sphere. The government role in agriculture has been in providing support (subsidies, loans, expenditure on education, research and extension services...etc.); ownership is left to the private sector (Elgari,1983).

However, oil in Saudi Arabia (as well as other minerals) falls under public ownership. That is to say, the government solely owns and controls both oil production and revenues (Sharshar, 1977). In this regard Saudi Arabia may be referred to as both a "rentier state" (Beblawi, 1987) and an "allocation state" (Luciani, 1987). It is a rentier state because oil revenues, the major source of income are generated from external sources (oil export). It is an allocation state because the state is the recipient and dispenser of these oil revenues.

Increased oil revenues since the early 1970s, enhanced the state role in society. This is not only because rising oil revenues enabled the government to dispense oil income in ways that ensured political stability but they also " free[d] the state from the need of raising income domestically" (Luciani, 1987:69). In other words, the government plays the dominant role in the economy.

Because oil revenues accrued to the government were then allocated to each sector of the society, government support and expenditures in agriculture may be considered part of

income distribution (Askari, 1990). Providing subsidies and loans to agriculture is a way of extending oil benefits to the small farmers. At the same time it is also a method both to assist these farmers to endure the rising cost of living and farming expenses, and to generate more agricultural production and farm income so they can survive and maintain their main source of income, their farms. In this regard, therefore, agricultural support is fulfilling the legitimation function, as discussed in Chapter II.

However, while oil revenues enhanced the state's position in relation to the country's domestic structure, the reliance on oil put the country in a precarious position vis-a-vis international politics. The dependency of Saudi Arabian economy on a single commodity (oil exports) weakened the government's bargaining position in the world arena, particularly with respect to setting oil policy.

This largely explains the government's recent interest in agricultural development. Agricultural development is looked at as a mechanism to reduce the country's dependency on both oil (economic diversification) and imported foods (self-sufficiency). In a speech before the Ninth Agri-Energy Roundtable in Geneva, Switzerland, in June 1988, the Saudi minister of agriculture reflected this concern:

> most important of all is that today we are able to proclaim with pride the accomplishments of our self-determination with which we have silenced those voices that we

> heard only a few years ago offering us a bushel of wheat for a barrel of oil. We opted instead for food security through self-sufficiency which we have achieved with dignity. Otherwise, we would now be hearing similar sounds, but this time they would probably be demanding two barrels for one bushel. My response to such utterance would simply be that today each bushel of our own wheat is part of our national dignity and self-esteem (Al-shaikh, 1988:11).

The enthusiasm over increasing local food production, therefore, led the government to encourage the involvement of private capital to establish large-scale operations which take advantages of mass production. But, as indicated in Chapter II, capital, by its nature, is less prone to investment in agriculture. This is because capital operates under the principal of profit maximization which is not easily met by agriculture due to some inherent obstacles. For example, excess of labor time over production time and the perishability of some agricultural commodities (Mann and Dickinson, 1978).

To overcome this constraint, the government vigorously began extending agricultural incentives (subsidies, loans, free lands) to private capital to attract its investment in agriculture. These incentives, therefore, represent the accumulation role of state expenditures in agriculture. But the expansion of these large scale farms, as indicated in Chapter V, is increasingly dominating Saudi agriculture and undermining the traditional sector (small farmers). In other words, support to these large farms contradicts and

jeopardizes the legitimation role played by the same agricultural support to small farmers.

In sum, the main motive for the Saudi state's involvement in agriculture, through either nomadic settlement or financial support, has been political in nature. The nomadic settlements played an important role in the "detribalization," thereby neutralizing the tribes as a potential challenge to the state's establishment process. With tribal disintegration, the state was relieved of a major destabilizing force (Uthaimeen, 1986; Fabietti, 1982). Through the distribution of agricultural subsidies and loans to nomads and settled farmers, the state succeeded in channeling oil income to the rural sector. Subsidies and loans helped the government not only in generating the farmers' and nomads' loyalty and support, but also reduced their marginalization which otherwise may have triggered a sense of resentment and dissatisfaction (Uthaimeen, 1986).

The political gains from governmental support of agriculture has been the reason for the state's continued support to agriculture, despite mounting financial deficits since 1982 and the increasing criticism leveled against the country's agricultural program as too costly. The Saudi minister of agriculture alluded to this issue:

> Unfortunately, we have become a target of attack, mainly from some countries that dismissed our experiment in agricultural development as being unnecessary and too

> costly. My reply to these voices of attack is that cost is a two-faceted phenomenon. What may be regarded as a cost from a commercial point of view may be simultaneously regarded as an income or a return from a social and national point of view (Al-shaikh, 1988:6).

Saudi Arabia's current agricultural support policy is Undermining the long-term prospects of its rural and agricultural sector. First, there is a growing dependency of farmers and agricultural activities on agricultural support (Looney, 1988) which in turn relies on oil revenues. This poses a major threat to long-term prospects of agricultural and rural development. This is not only because both oil prices and revenues are subject to sudden, often unexpected, fluctuations [a good example was in 1986 when oil prices dropped in six months from US $ 28 to US $ 8 per barrel (Looney, 1990b)], but also because oil itself is a depletable and non-renewable resource. Oil values are conditioned by its viability as a main source of energy. Oil supplies are limited and may not last for long, given the world's constant search for alternative sources of energy. Even if oil remained a viable source of energy for some years to come, oil is ultimately a depletable, non-renewable resource.

The decline in oil revenues since 1982 has resulted in reductions in agricultural loans. It should be noted that the government was able to compensate for declining oil revenues, maintaining moderate levels of expenditures by tapping foreign reserves generated from the fat years 1973-1981

(Looney, 1990b). These foreign reserves are also limited [estimated at US $ 90 billion in 1988 (Ibid)] and will not survive for long if subjected to continuous withdrawals. The fact of the matter is that if oil prices tumbled further or if oil was depleted, the maintenance of agricultural support programs at current or similar levels will be difficult.

A major cut or termination of agricultural support is likely to negatively impact agricultural and rural sector. The possible outcomes includes: 1) many small farmers who have persisted largely because of the government assistance despite the rising costs of farming and living may find no alternative but to abandon their farms and join the exodus to urban centers (Senani, 1983; Lackner, 1978); 2) many large-scale farms who have developed and survived largely because of the government's lucrative agricultural support program, are likely to fold up and search for more profit-maximizing investments in other sectors (Mclachlan, 1984); 3) feelings of frustration and deprivation will develop among the farmers and will likely undermine their support and loyalty to the state (Uthaimeen, 1986).

> Many Saudis acquired extensive capital as a result of state loans, grants and the general expansion of the economy. All of these types of welfare programs generated enormous legitimacy. Thus, if there is a crisis in the welfare state, it will have profound implications, since the various welfare programs have become so central to the institutional order of Saudi Arabia. The Saudi nationals have become completely dependent on

> the state as a consequence of the massive expansion of public sector employment and the expansion of various types of direct and indirect state subsidies, just as the state has become dependent on welfarism to generate legitimacy. Thus, deep cuts in various programs and benefits may, in the long run, undermine some of the legitimizing functions of welfarism (Uthaimeen, 1984:351-52)

Second-- and this is of paramount importance-- agricultural expansion accelerated the depletion of underground water, a limited and vital resource in Saudi Arabia where there is a shortage in surface water. The decline in water table will have severe negative consequences on the future of agricultural and rural sectors. Many farms, and some oases, will be undermined and may not be able to survive. One researcher noted:

> falls in water table have already began to point out the dangers of overuse of the critical factor in Saudi agriculture-water. There, perhaps, lies the greatest danger, that the fragile agricultural environment in Saudi Arabia may be irreparably damaged by over-rapid and over-extensive exploitation, of which the current enthusiasm over wheat production is the first sign" (Joffe, 1985:224).

Third, the small reduction in the dependency on imported food that resulted from the recent expansion in agriculture is increasingly being replaced by a growing dependency on imported agricultural technology and foreign labor. The dependency on the outside world for the supplies of

technologies and labor will limit the potential for agricultural development. This is not only because the acquisition of these supplies will be interlinked with the country's financial ability (oil revenues), but also because technology and foreign labor are subject to international politics, (i.e., embargo or restrictions due to differences or conflict between Saudi Arabia and technology or labor-exporting countries). Therefore, agricultural growth along the lines achieved in the previous decades offers no escape for the country from its dependency on the outside world (Khuthaila, 1984).

Given these problems, particularly the water constraint and the high economic costs which cannot be sustained indefinitely, one finds it difficult not to conclude that the long-term prospects of Saudi agricultural and rural sector under current policy are "uncertain at best" (Looney, 1988:244).

Finally, in light of the Saudi agricultural experience during the last years as revealed by this study's findings, one may conclude government involvement in agriculture by providing subsidies and credits is a viable means of achieving agricultural growth. But the same findings also suggest that this conclusion does not imply a recommendation for other developing countries. This is not only because of agricultural concentration and dependency on imported technology accompanying this "experiment" but also because resulted

agricultural growth has been achieved at immense economic costs (subsidies, loans and other expenditures on agriculture), an approach open only to an oil-rich country where political goals outweigh economic considerations (Joffe, 1985:224).

Suggestions for Future Research

This study explored and evaluated the relationship between state and agriculture in Saudi Arabia, reaching some important findings and providing insights and comments into the role of state involvement in the changes and future prospects of rural and agricultural sectors. However, as much as the study succeeded in answering some questions, in this regard it raises other important ones that still need answers. Among these questions and issues are:

1) This study's findings and comments were based on examining government statistics. It would be interesting to know how farmers and nomads (the "intended beneficiaries") perceive and evaluate this process of state involvement in agriculture and its outcomes. Questions to be asked include how they see their present and future benefits or costs; what their visions and expectations are for the future of agricultural and rural sector; what type of feelings and attitudes they hold toward current agricultural policy; and what types of changes they would like to see introduced to this policy.

A study that could generate answers to these and other related questions would contribute to the depiction of a more comprehensive picture of this relationship and would supplement this study's findings in providing information which would prove invaluable to policy makers in reassessing the current agricultural policy.

> Putting people first ...means recognizing that each project generates its own unpaid monitoring and evaluation team-the local participants who experience the project firsthand as it is implemented, and who must live with its results for years after the consultants have left. It should be a fairly simple matter for government, consulting firms, and local development agencies to tap this information pool and put it to productive use (Kottak, 1985:354-5)

This objective may be achieved through undertaking a field study conducting observations and interviews with a representative sample of farmers and nomads from different parts of the country.

2) Agricultural policy in Saudi Arabia is not confined to the agricultural support program (loans, subsidies and land distribution). It includes other important components such as the expenditures on agricultural research and education, extension services and the agricultural infrastructure (roads and dams). The present study only addressed the support program. The role of the state in agricultural and rural change and development would be clearer if some of or all of the other components of agricultural policy were subjected to evaluative studies.

3) One of the major findings in this study is that there exists a relationship between agricultural policy and the growth of foreign labor and the decline of Saudi labor in agriculture. It would be valuable to know if this policy also affected the division of labor in farm families. For example, did agricultural support and the associated process of mechanization change the nature or amount of time and work performed by each family member ? What types of changes occurred and what are their implications for agricultural development?

4) It has been suggested that with the continuous decline in oil revenues since 1982, "the experiment in massive government support for agriculture will be significantly reduced" (Looney, 1988:241). Yet, it was found in this study that between 1982 and 1988 only a few cuts were introduced to agricultural loans but subsidies were increased. It was suggested that the use of the country's foreign reserves helped in reducing the overall effect of the decline in oil revenues on government expenditures including agricultural support. However, it would be beneficial to conduct a follow-up study that incorporates data for the years since 1988. The study would not only complement the findings from the present study but would also explore the effects of the continuous decline in oil revenues, last year's "gulf crisis" and the government's financial commitment to the war on its expenditure on agriculture.

Epilogue

The Saudi state's agricultural support exhibited some of the consequences inherent to state expenditure on agriculture as indicated in Chapter II. Nevertheless, this involvement brought about a noticeable agricultural growth.

The role of the state as a "promoter" of economic development, particularly among third world nations, is widely acknowledged (e.g. Rueschemeyer and Evans, 1985). The Taiwan case is a good example in this regard. The intervention of the Taiwan state in agriculture through land reform and the provision of credits and fertilizers to farmers stimulated a considerable agricultural growth which in turn generated surplus for the development of industry and other sectors of the economy (Amsden, 1985).

The state's "relative autonomy" from the local social structure seems to play a decisive role on the success of state intervention in bringing about an economic development (e.g., Rueschemeyer and Evens, 1985). This was the case in respect to Taiwan. The Taiwan state enjoyed a degree of an autonomy from its agrarian structure lacking in many developing nations (Amsden, 1985). Similarly, in Saudi Arabia oil not only enhanced the position of the state in relation to local social structure but also provided the state with the means to pursue its objective of agricultural expansion not available to many developing Countries.

APPENDICES

Appendix A: Saudi Arabian Riyals Per US Dollar 1963-1988 (Annual Average)

Year	Rate	Year	Rate
1963	4.50	1976	3.53
1964	4.50	1977	3.53
1965	4.50	1978	3.49
1966	4.50	1979	3.35
1967	4.50	1980	3.35
1968	4.50	1981	3.33
1969	4.50	1982	3.42
1970	4.50	1983	3.44
1971	4.49	1984	3.49
1972	4.32	1985	3.57
1973	3.98	1986	3.65
1974	3.56	1987	3.74
1975	3.53	1988	3.74

Source: World Bank, World Tables 1976, 1989-90.

Appendix B: Saudi Fiscal Year and Hijra Year Dates and Gregorian Equivalents

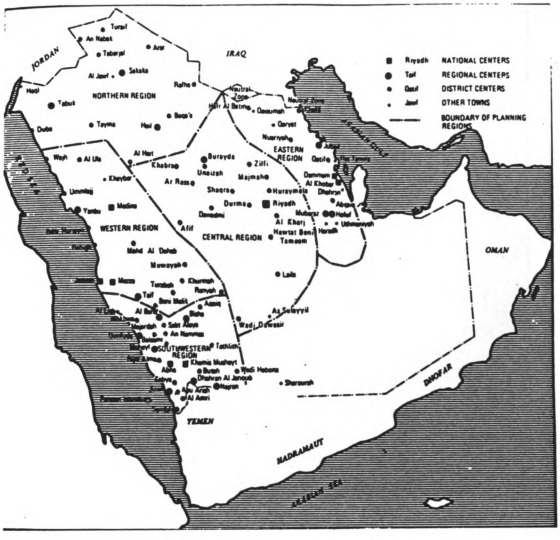
Saudi Fiscal Year (1 Rajab to 30 Jumad II)	Start on*		Hijra Year	Starts on*	
1385/86	25 Oct.	1965	1385	1 May	1965
86/87	16 Oct.	66	86	21 April	66
87/88	4 Oct.	67	87	11 April	67
88/89	23 Sept.	68	88	30 March	68
89/90	12 Sept.	69	89	19 March	69
First Development Plan Period 1390/91 thru 1394/95					
1390/91	2 Sept.	1970	1390	9 March	1970
91/92	22 Aug.	71	91	26 Feb.	71
92/93	10 Aug.	72	92	15 Feb.	72
93/94	30 July	73	93	4 Feb.	73
94/95	19 July	74	94	23 Jan.	74
Second Development Plan Period 1395/96 thru 1399/1400					
1395/96	9 July	1975	1395	13 Jan.	1975
96/97	28 July	76	96	2 Jan.	76
97/98	16 June	77	97	22 Dec.	76
98/99	6 June	78	98	11 Dec.	77
99/1400	26 May	79	99	30 Nov.	78
Third Development Plan Period 1400/01 thru 1404/05					
1400/01	15 May	1980	1400	19 Nov.	1979
01/02	4 May	81	01	9 Nov.	80
02/03	23 April	82	02	28 Oct.	81
03/04	12 April	83	03	17 Oct.	82
04/05	2 April	84	04	7 Oct.	83
Fourth Development Plan Period 1405/06 thru 1409/10					
1405/06	22 March	1985	1405	27 Sept.	1984
06/07	11 March	86	06	15 Sept.	85
07/08	28 Feb.	87	07	4 Sept.	86
08/09	17 Feb.	88	08	24 Aug.	87
09/10	7 Feb.	89	09	14 Aug.	88

Hijra months
Muharram
Safar
Rabi I
Rabi II
Jumad I
Jumad II
Rajab
Shaban
Ramadhan
Shawwal
Dhul-Qi'dah
Dhul-Hijjah

Gregorian months
January
February
March
April
May
June
July
August
September
October
November
December

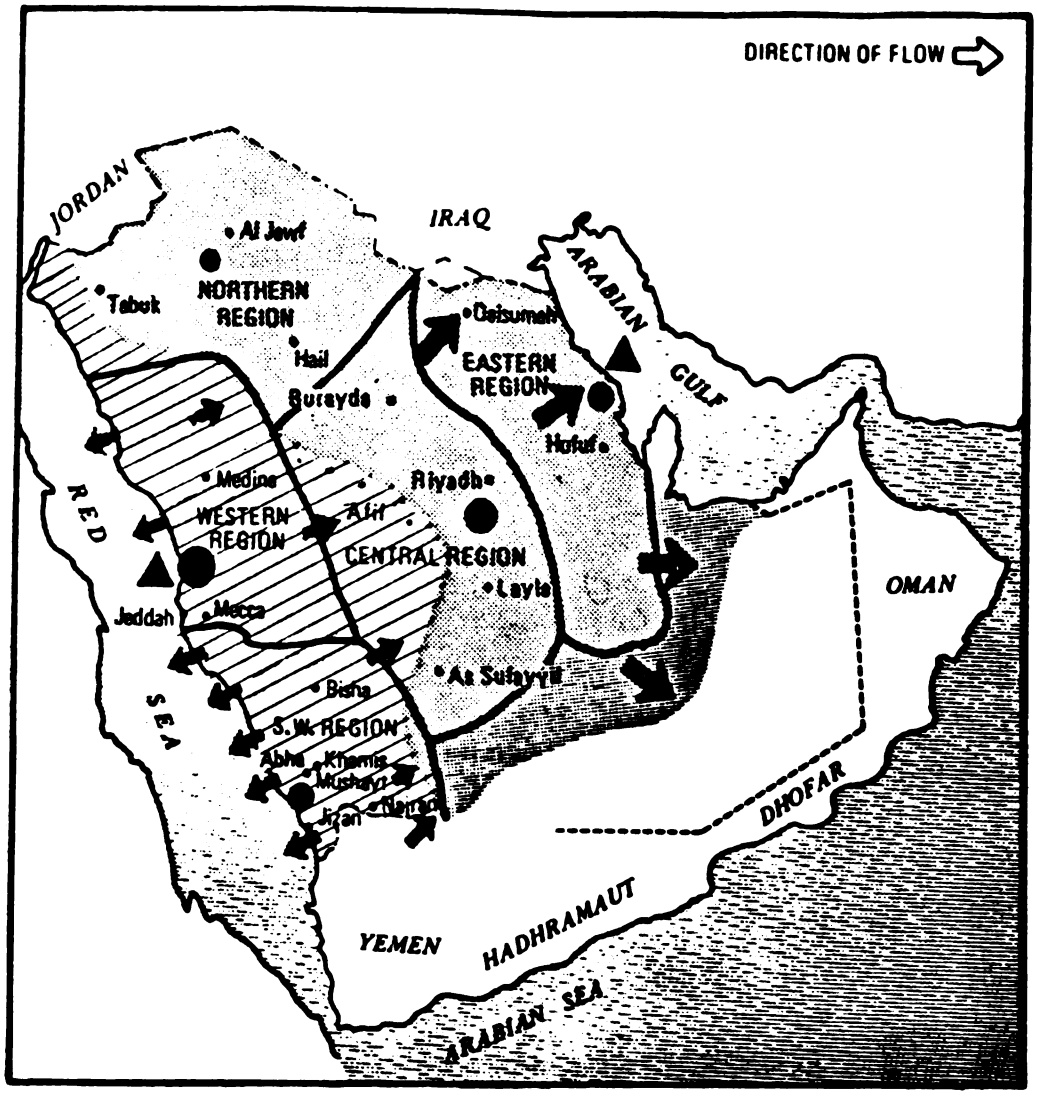
Source: Ministry of Planning, Third Development Plan 1980-1985.

Appendix C: Saudi Arabia Regions Delineation Map



Source: Ministry of Planning, Third Development Plan 1980-1985.

Appendix D: Saudi Arabia Water Resources Map



Source: Ministry of Planning, Third Development Plan 1980-1985.

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