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TRANSFORMATION OF AGRICULTURE IN WESTERN SAUDI ARABIA :
PROBLEMS AND PROSPECTS

by

Mohammad M. Al-Raddady

(The Graduate Society)

A thesis submitted to the Faculty of Social
Science for the Degree of Doctor of Philosophy, University
of Durham, September, 1977.

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P A R T O N E

THE TRANSITIONARY NATURE OF
WESTERN SAUDI ARABIA AGRICULTURE

ABSTRACT

This thesis examines the transformation of traditional agriculture in Western Saudi Arabia. Particular emphasis has been placed on illustrating the way in which certain environmental and spatial constraints affect the development of traditional agriculture. National and international issues pertaining to the structural transformation of traditional agriculture have been systematically reviewed.

The thesis consists of two parts. Part One considers the transitional nature of Western Saudi Arabia agriculture in four chapters: some environmental problems and Islamic institutions regarding land, labour constraints and agricultural change, the role of capital in transforming traditional agriculture and Ibn Khaldoun's geographic model and view of traditional co-operation. Part Two examines the process of agricultural transformation in three chapters dealing with three phases of transformation. The hijra as a point of departure: Phase I; the national policy for agricultural transformation. Phase II, and international transfer of technology and structural transformation: Phase III.

The thesis ends by summing up the general findings of the study and indicates potential areas for possible solutions to development issues.

ACKNOWLEDGEMENT

The author is grateful to institutions and to many people who have made important contributions at various stages of the study.

Many thanks are due to King Abdulaziz University which granted me a scholarship to complete my studies in Great Britain. I wish to thank His Excellency, Dr. M. Yamani, Minister of Information and former Rector of King Abdulaziz University, for his help and encouragement. I owe a particular debt to Dr. M. Zayyan, Dean of Faculty of Arts, not only for his encouragement to continue my studies abroad, but also for personal help to my father during my stay in the United Kingdom. I owe a debt of gratitude to His Excellency Sayyed Ahmed Obaid, former Deputy Minister of Agriculture and member of King Abdulaziz University Foundation Committee, for sincere help and encouragement in my endeavours. I am grateful to Dr. H. Abu Rokba, Dean of Faculty of Economics and Administration, whose help in and outside King Abdulaziz University was invaluable. He arranged for and organised the Academic Mission to Abha. Many thanks to His Highness, Prince Khalid Al-Faisal, Governor of Asir, not only for his hospitality during the stay of the team in Abha, but also for placing various facilities at the disposal of the team and for arranging with the authorities for help to the Academic Mission.

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Here at Durham so many people have assisted me, that it is not possible to mention them all. I am grateful to Professor W.B. Fisher and Professor J.I. Clarke. At the Centre for Middle Eastern and Islamic Studies, I should thank Professor H. Bowen-Jones and the librarians of this Centre who offered great help during my research.

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I would like to acknowledge the help of librarians at the University of Durham. Mrs. J.M. Chisholm has not only provided courteous assistance at the Science Library, but has also traced some references through the British Inter-Library Loan Scheme. Many thanks also are due to Mrs. M. Mackie for her help.

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Special thanks are due to my wife Nawal; her unfailing encouragement and good sense have been indispensable throughout the course of this study.

Finally I should thank my children: Mamdoh, Abeer and Walid who have rarely been satisfied with answers to their questions without asking an additional 'why'?

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General IntroductionIntroduction

The aim of this thesis is to examine, in their spatial context, the principal socio-economic problems facing the transformation of agriculture, crop and animal husbandry in Western Saudi Arabia (the Hijaz).

The complex issues of the modernization of traditional agriculture are analysed both historically and geographically. Consideration is given to selected aspects of Islamic land traditions, particularly in their contemporary impact on the locational organisation of settlements and land use. Attention is directed to the continuing relevance of the writings of the classical Arabian scholar, Ibn Khaldoun, especially his concept of Asabiyya. The developmental policies of King Abdulaziz hijra in the early twentieth century are also considered.

Indigenous and exogenous constraints on the transformation of rural land use in the Western Arabia are systematically reviewed, and the thesis is advanced so that the analytical concepts and theories of geographers and economists should be amalgamated in an effort to seek rational solutions

to the problems of modernisation in the agricultural sector. Thus the fundamental factors of production land, labour, capital production and consumption; marketing of surplus crops and livestock; and diffusion of innovations are examined in both spatial and economic terms, utilizing complementary tools of analysis.

Organisation

The thesis is organized into two Parts and eight Chapters.

Part One examines the major constraints on factors of production and identifies the transitory nature of agriculture in Western Saudi Arabia. Physical spatial problems and Islamic institutional arrangements of land are analyzed in Chapter One. The author argues in this Chapter that, in order to understand the relation of land to agricultural transformation, an appreciation of three criteria is essential : land concepts, land and economic structure, and finally, land tenure and economic incentive. In this light new trends influencing agricultural land expansion are considered, followed by an appraisal of contemporary land systems in Saudia Arabia.

Chapter Two considers the way in which farmers and labour respond to problems of location, i.e. tribal migration, transitional migration types. Direct and indirect effects of environments are examined under determinants of the bedouin attitudes toward work (cultural bias) and the structure of the bedouin economy respectively.

Chapter Three deals with the problems of capital formation. It elaborates the transitional process underlying the creation of both traditional and modern capital. The weaknesses of traditional marketing structures are considered within their locational context, followed by an account of the present developments in generating capital under agricultural modernisation.

Chapter Four draws on the Khaldounian geographical "model" to indicate the way in which national temperament affects the processes of transformation.

Part Two takes up the processes of agricultural transformation.

Chapter Five shows how King Abulaziz's hijra represents a turning point in Saudi

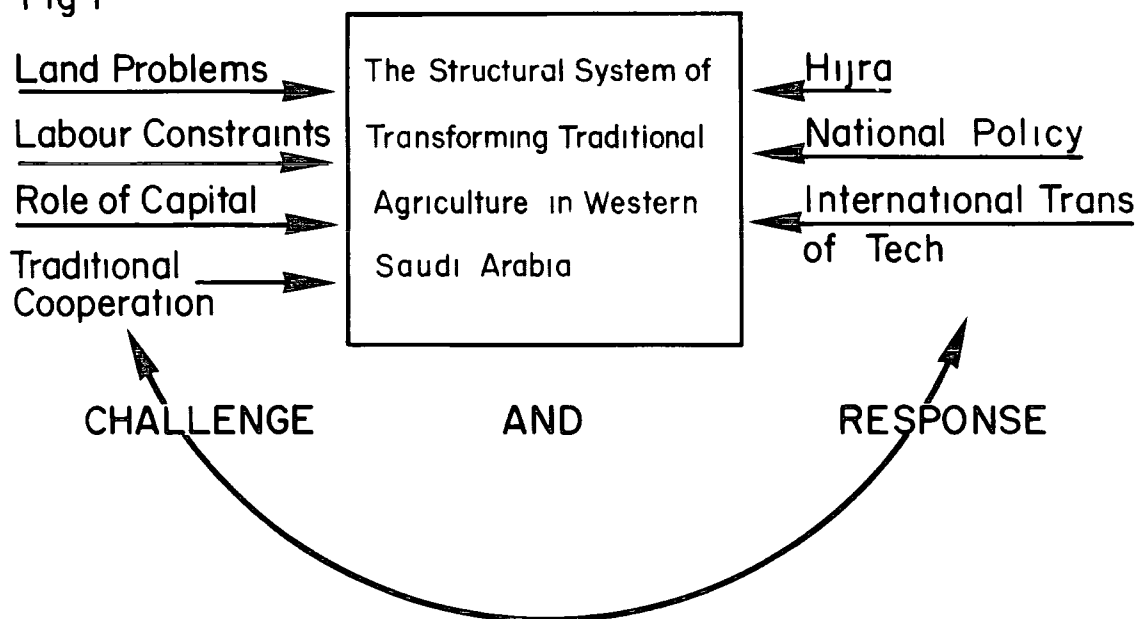
agricultural development : phase one.

Chapter Six explains the present national policy as an extension to the hijrah, marking the second phase.

Chapter Seven considers international transfer of technology, signifying the third phase in the process of modernisation.

The following diagram Fig. 1 is designed to show the relation between the various chapters i.e. the Two Parts. Land; Labour, Capital and Traditional Co-operation are inputs into agricultural transformation. The study revealed the sort of challenge they produce. Hijra, National Policy and International Transfer of Technology have been considered as response or reaction to such challenge as in the following figure:

Fig i



Definition of Terms

For the purpose of this thesis The term traditional agriculture, though it refers to limitations of the old methods of production, is used to describe the gradual development of agricultural techniques before the present introduction of advanced agricultural technology.

Agricultural transformation is advanced to mean structural change involving sequential improvements in organisation and techniques of production.

The two other terms related to the processes of transformation are economic development and modernisation. The former is not confined merely to economic growth which might increase agricultural products; it is broadly employed to include changing relation of factors of production, e.g. occupational structure; specialisation; growth of villages. The latter term - modernisation - is utilized to include any improvement in the level of agricultural productivity. Its main features are : division of labour, the spatial diffusion process and impact of certain ideas on social mobility, and extent of application of science.

Significance of Study

Saudi Arabia, a land of Islamic civilisation, possesses a large geographical area well-connected with the outside world and is characterised by traditional agriculture. The literature on Saudi Arabia is extensive emphasising, in particular, the recent oil discoveries which have catapulted a relatively poor country to the summit of the rich nations. Yet few efforts have been made to explain systematically the processes by which traditional agriculture have been integrated into a national policy. The acquisition of agricultural modernisation necessitates the application of science. What does this really imply?. What sort of ingredients have shaped traditional agriculture?. Why have the processes of agriculture in Western Arabia taken their particular course?.

It is hoped that by dealing with these issues throughout the thesis, a contribution to the existing knowledge of transforming traditional agriculture into a viable source of growth will be achieved.

Both the scale of spatial analysis and the author's choice of topic stem from three factors:

1. The author lived in Madinah until 1962, and

engaged in agricultural activities with his father. Practising farming and agricultural business were neither confined to the Madina area nor restricted to field activities. He was involved in the agricultural problems in the surrounding villages : Al-Jafor; Al-Mulaileeh; Wadi Al-Safra; Al-Fegreh where his father is an owner of small farms. Financing and transportation problems of traditional agriculture revealed to the author the pressing problems facing the average farmer, problems typical to the entire Western part of Saudi Arabia.

This is not to claim that growing up in an agrarian society entails accurate understanding of the complexity of agricultural development but it is to put on record personal insights, and to supplement such observations with well-documented scholarly works.

2. The author's interest in agriculture was reinforced when his career was interrupted by study at Riyadh University, teaching in the Ministry of Education and subsequently lecturing at King Abdulaziz University. Special access to the government documents, in and

outside the University was possible for both research and lecturing.

3. More important, the author was fortunate to be appointed as a Deputy for the Academic Mission in Abha where he conducted field research with a University team in that area. His Excellency the Governor of Abha : Khaled AL-Faisal facilitated the team's access to Government documents and arranged daily trips to the site of field work. Intensive interviews with officials of the Ministry of Agriculture were undertaken. Experience gained in this assignment has been utilised in writing of this thesis.

A scholarship from King Abdulaziz University has enabled the author to study at Durham University where the exceptionally stimulating academic facilities and up-to-date materials on Saudi Arabia and Middle Eastern Countries have made possible the development of previously accumulated materials on agricultural transformation.

Author's Qualifications

The author graduated from Riyadh University in 1962 (B.A.) and taught in the Ministry of Education until 1966 after which he received a scholarship from King Abdulaziz University, enabling him to graduate from the University of Colorado in 1968 (M.A.). Thence he was appointed as a lecturer at King Abdulaziz University in the following topics:

1. Economic History of the Middle East.
2. Economic History of Europe.
3. History of Economic Thought (Development of Economic Theory).

The author has published two papers relevant to the present thesis (in Arabic):

1. "Saudi Arabia Economic System : the Bedouin Economy as a Middle Way."
2. "Economic Development in the Context of Islamic Institutions."

PART ONE

CHAPTER ONE

Some Environmental Problems and Islamic Institutions Regarding Land

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Introduction

The objectives of this chapter determine its organisation. The way in which some environmental problems and Islamic institutions affect land development is examined under eight sections. Sections one and two review certain environmental problems whereas sections three and four delineate the Arab perception of his own milieu and how he reacts to such constraints. Section five draws attention to the fact that terminological confusion tends to make an assessment of Islamic land system misleading and inaccurate. The author's argument is extended in sections six and seven as an attempt to develop alternative criteria in order to appraise both agricultural change and land development, i.e., the spatial economic structure and economic incentive in a geographical context. Section eight is an appraisal of the Saudi Arabian land system.

1. Some Environmental Problems and the Arab's
Perception of his Environment

The processes of transforming traditional agriculture in Western Saudi Arabia (Fig.1.1) are channelled via the physical structure and shaped through Islamic institutions. The nature of reciprocal relations between these variables will be examined under two headings . some environmental problems and the Arab's perception of his environment.

Western Saudi Arabia is known geographically as the Hijaz (barrier), with altitudes ranging from 1000 to 3000m. The altitudes gradually increase towards the south reaching their zenith south of Makka (Mecca). Rifting and fracture represent the main feature of Hijaz valleys and mountains along the Red Sea.¹ Furthermore, the escarpment of the Arabia massif involves short streams which characterize Wadi Hamdh, extending from south Madina to the north beyond el-Ula.²

1.1. Superficial Features

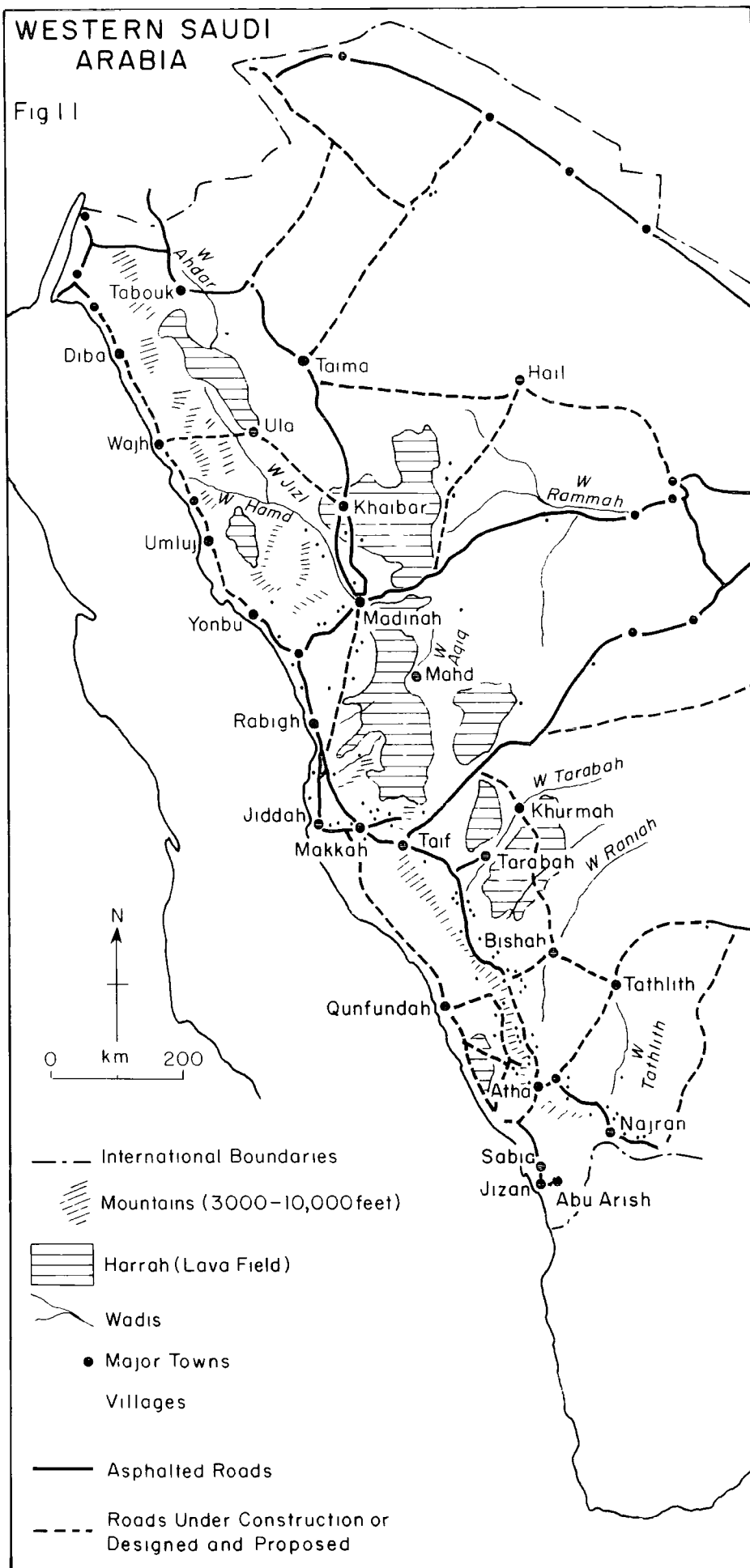
The sensitivity of the soil to erosion processes in Western Saudi Arabia is conspicuous. For example, sand and alluvium in Wadi Fatima and Wadi Hamdh tend to invite soil erosion while accumulation of gravels in Al-Jafor oasis offers considerable resistance to floods and

1. William C. Brice, A Systematic Regional Geography, Volume VIII, South-West Asia (London University of London Press Ltd. 1966), p.32.

2. Ibid. p.34

WESTERN SAUDI ARABIA

Fig 11



erosion. This is almost a typical situation along the Hijaz mountains and valleys or wadis. To examine certain aspects of environmental effects on agriculture, in this regards, four examples will be introduced.

1.1.1. Harra (lava)

Lava is one of the main features in the area under study, covering substantial parts of the Hijaz landscape. Harrat al-Oairedh is a famous harras, extending from Tabuk to el-Ula. It is more than 100 miles in length approximately 90 miles in width, and has an average height of 500 ft. Harras of Madina and Khayber are further examples, and have been described by Ibn Khaldoun³ and contemporary geographers likewise as barren and unproductive land.⁴ However, these two harras are somewhat exceptional in that in places they support cultivation and supply urban water.

1.1.2. Sabkha

The word Sabkha means unproductive land and includes any soil which contains a few centimetres of salt concentration in the surface layer. Neither its thickness nor its area are the same throughout the region. Nine places branded as "sabkha" are famous

3. Abdulrahman Ibn Khaldoun, Al-Mugaddiaah, trans. An Introduction to History, Baghdad : Al-Muthanna Publishers, n.d.) p.88.

4. William C. Brice, op. cit. p. 267

in Saudi Arabia and two of them lie within the Western Region.⁵ Both water and soil are hardly suitable for cultivation except in the case of tree-palm which not only tends to resist saline soil but also tend to spread its roots vertically and horizontally away from the sabkha layer. Madina and Al-Molaileeh are characterised by sabkha soils yet this type of land does not exclude the possibility of cultivating both alfalfa and palms.

The origins of sabkha in Western Saudi Arabia are not well understood. However, literature to the present tends to stress two theories. One maintains that sabkha are the remains of former lakes which have dried out.⁶ The other stresses a connection between water management and sabkha development. The latter suggests that solar heating and evaporation are the main causes. Of course any one of these causes suggests its solution. If it is solar heating and evaporation little can be done about it, but if it is a matter of water management it is obvious that new techniques are needed.

1.1.3. Wadis

Most oases in Western Saudi Arabia are located in wadis which are both numerous and important. Their

5. Foaad Hamza, The Heart of the Arabian Peninsula (Al-Salafia Publisher, no place given, 1933) pp. 42 - 45.

6. Ibid., p.43.

importance lies in that they lend themselves to settlement and economic activities. Wadis Fatema and Wadi al-Hamdh, like other wadis, serve as grazing areas and cultivated land. They capture flood waters from tributary wadis and the surrounding mountains to function as natural reservoirs. The recent development of villages along these wadis and the growth of the settlement in Western Saudi illustrate this.

1.1.4. Soil

In spite of the absence of accurate knowledge regarding the distribution of soil types in Western Saudi Arabia it is reasonable to deduce its general features from the main characteristics of the semi-arid regions and from soil classification of Wadi Jizan.⁷ Soils of arid lands are clearly a product of climatic conditions. Soils in Western Saudi Arabia are no exception. Moreover, although plants differ in degree of sensitivity and tolerance, climatic factors are also profound on them, notably in diurnal heat and nocturnal cold. Tomatoes and vines usually wither and die. Leaves and branches and other parts of plants are also influenced by the frequency of cold nights and hot days; simultaneously plant roots penetrate into the lower layers meeting either cold or hot temperatures depending on the

7. The government of Saudi Arabia, Ministry of Agriculture and Water, Irrigation Development in The Wadi Jizan, Draft Annex 1 on Soils and Land Classification (1972) pp.44 - 57

time of plant growth and the stage of soil formation.

While the processes of physical and chemical weathering have shaped the basic features of soil in the Western Region other counter factors have modified such effects in Madina and Khayber. Wet soil layer has reduced permanent soil erosion; for this reason the Madina fine textured soil has remained as it was, a source of fertility and development. A similar situation prevails in Al-Jafor and the surrounding mountains where soil structures tend to resist the processes of erosion.

1.2. The Climatic Conditions

The four points previously discussed showed how the physical environments tend to impose powerful constraints on agricultural transformation in Western Saudi Arabia and, indeed, on most of the country. For one main reason the geographical position of the country is characterised by intense heat in the summer and low pressure. Maximum temperature is in the neighbourhood of 43 Centigrade (in the shade) in most parts of the country.

The development of high pressure during the winter is a geographical phenomenon consistent with the continental position of the Arabian Peninsula within the belt of desert extending from North Africa and terminating in the Indus basin⁸ and has subjected the entire country to constant

8. William C. Price, A Systematic Regional Geography, Vol VIII South - East Asia pp.19 - 20.

desert conditions. It is its geographical location, then, that makes Saudi Arabia an arid region.

1.2.1. Winds

This type of climate creates strong hot winds via the circulation of the global system. The impact on agriculture is obvious. Water evaporation is a contributing factor to shortage of water resources. Dune development is another constraint on agricultural development. Rates of dune mobility are relatively high in the summer. Yet, Western Saudi Arabia (Fig 1.1) is less affected by them because their structure, concentration and stability are governed by the extent of the mountains and the seasonal cycle. Hijaz mountains reduce the wind's damaging effects and have made traditional agricultural development possible. In the deep Wadi of Al-Hamdh, however, the wind known as Assaba is well-known for its damaging effects because it conveys fine dust which accumulate in unstable layers over the fields. This has made Al-Molailæh less suited for cultivation. The author who has occasionally visited this small oasis has noticed that alfalfa and small palm-trees have been buried under accumulated sand.

1.2.2. Topography

The mechanism of atmospheric pressure systems

produces circulation of hot winds into low pressure regions, making aridity of the interior the main feature of the country. In contrast with the Hijaz mountains and the strip along the coastal lines in which moisture and occasional rains have created favourable conditions for both cultivation and grazing activities.

1.3. The Arab Perception of his Environment

Having identified certain environmental limitations, it is important to examine the ways in which the local people respond to their environment; for, if the physical conditions tend to fix the location of cultivated areas and economic activities, the way in which the human reaction takes place - mentally and physically - certainly determines the ultimate adaptation to the natural setting. While literate people use symbolic expressions i.e. diagrams, graphic representations and other devices which facilitate exposition of ideas and communication, an illiterate community appreciates the "power of unwritten word". This gives rise to the following concepts and is what might be called a conventional geographic gazetteer incorporating the local classification.

1.3.1. The Conventional Geographical Gazetteer

This could be termed an ungraphed map and

unwritten atlas for it serves as an effective device for most of bedouin community. Place names are carefully selected to 'flash in the mind' of an Arab the general physical characteristic with which he is acquainted. His language system depends heavily on a combination of exactness and conciseness which in turn has facilitated his perception to the desert environments and has produced a distinctive geographical atlas which conveniently suits the illiterate farmer. The well-known words harra and nafud are illustrative examples; harra is a name given to a black, sombre landscape with a maximum height of 600 ft. This is, however, only a general landscape from which the bedouin have distinguished several separate names to convey specific meaning. Rehba is a land with grasses and trees, contrasting with Labah, which signifies a locality essentially located within harra, and sharply bounded by steep beds of lava in large blocks. Furthermore, mere harra, to the classical Arab in general and the bedouin in particular implies the scarcity of both water and pasture while the other more specific terms indicate the possibilities of grazing areas and water locations.

1.3.2. The Significance of Local Classification

The local classification represents a form of indigenous ordering of space and suggests the manner in which the normal farmer responds to his environment.

To appreciate what this means one must see how the various degrees of desert have been arranged according to certain agricultural potentials as follows: *

Firstly, according to the general feature of landscape

- a) Al-Sahsah and Al-Safsaf : absolutely barren landscape, entirely devoid of life.
- b) Al-Sahb : a wide area possessing a significant homogeneity of soil and grasses.
- c) Wadi . a valley, implying potential water supply.
- d) Waha . an oasis, signifying irrigated land under active cultivation.
- e) Nafud . literally, an "exhausted" area.

Secondly, according to extent of existing life

- a) Al-Falah : an area of no existing water, yet with grazing potentiality.
- b) Al-Mahmah : an area of scattered pasture with no water which is dangerous and unexplored.
- c) Al-Rub' Al-Khali . the Empty Quarter.

Thirdly, according to extent of human safety

- a) Al-Bahma : unexplored land, risky and remote.
- b) Al-Majhal : a deceptive landscape.
- c) Al-Mafaza : a "safe" desert in the optimistic sense, similar to the notion of "Cape of Good Hope".

* The author based this classification firstly, on the common usage in the Western area (though only if such usage conveys spatial merit), and secondly, on whether or not a place name is original (classical) Arabic. Thus any names which failed both criteria have been abandoned.

This classification derives its importance from the landscape development of Western Saudi Arabia. For one thing the geographer cannot fail to see that Western Arabia routes are carefully tied to the supply of water and types of location as Figure 1.1. shows.

Furthermore, these categories are based on the actual perception of the Arabian farmers to their environments. Such a point of view affects the decision to graze, or cultivate, or perhaps to explore, new frontiers within the Arabian Peninsula. Equally, the three categories suggest various degrees of risk, at least in the mind of the ordinary farmer, which might reduce a potentially fertile land into a mere waste landscape. Under such circumstances, therefore, transformation of agriculture depends on two types of transportation system ; agricultural roads and ordinary roads. Additions and extension to these two types of transportation are, in fact, already under way. With regard to agricultural roads; this will create new economic links between the remote areas and the traditional oases, while expansion of existing roads vitalises and strengthens such links.

1.4. Constraints

The physical factors of Western Saudi Arabia and the Islamic land system have created distinct economic

links between the tribal districts, villages and cities. That is to say, the flow of goods and services tend to form a hierarchical system : this is because, without pastoralism, villages would not be able to obtain the traditional dairy products (cheese, dry milk and meat), without villages and oases agricultural products would not find their way to the markets; and without this normal functioning the agriculture would lack the foundation of basic development.

1.4.1. Hima

Experience in Saudi Arabia suggests that 'unorganised' space is a serious handicap to agricultural development. It is true that the above-mentioned dependence of villages such as Khayber and Wadi Fatema on the towns represents a simple form of specialisation. However, lack of effective national policy, coupled with weaknesses in marketing conditions, have made agricultural progress slow.

It goes without saying that the spatio-economic links have helped the system to maintain itself without offering the efficient marketing system which exemplifies the marketing organisation of industrialised nations. Until recently Madina and Taif products have hardly reached other parts of the country not because the oases' failure to secure agricultural surplus but because of lack of both

transportation facilities and absence of putting Islamic land tenure into effect.

Rightly, some geographers have maintained that rise and decline of villages in northern Hijaz are due to economic and inefficient organisation of space :

A number of towns and villages appeared, while some others disappeared. In both cases the primal cause was often the position of the place on one of the routes. The movement of the tribes to and from the Northern Hijaz was another determining factor. A third case was political and economic situation in the area in question. 9

These three causes could be reduced to one single cause to which various factors might be related . that is the disorganisation of terrestrial space within which certain Hijaz locations were functioning. Partly because economic incentives alone cannot operate properly unless the organisation of space of the various types of ownership are put into effect.

Recent study of grazing systems in Saudi Arabia has revealed the way in which traditional Islamic land tenure can serve a double purpose to stop soil erosion, and to protect the grazing areas. It is the hima land tenure which takes the following forms :

- a) the 'Absolute Hima' type in which grazing is prohibited in specific time such as in the time of drought.

9. A. Al-Wohaibi, The Northern Hijaz in The Writings of the Arab Geographers 800 - 1150, (Beiruth: Al-Risalah Est., 1973), p.426.

- b) seasonal or what might be called "Selective hima" where grazing areas are protected from camels and cows but sheep and goats are allowed.
- c) Flowering hima which in fact is seasonal hima but for a different purpose. It is intended to protect pasture land in the spring time in order to secure the flowers for bees and honey industry. Famous places of this type are Madina and Taif. According to Islamic law only this type is subject to tithe for public purposes.¹⁰

Sadly, the hima System which is part of Saudi Arabia land tenure is not applied to the entire national territory. FAO experts have reported instances in scattered parts of the country and have recommended that the hima System found at present at Saysad near Taif, which was established in 1965 and is still under the government control, should continue to be used as a model for elsewhere.¹¹ Although the hima system hardly exists in other Arab countries, it seems that a new era for this type of land tenure is emerging in Syria, Lebanon and Tunisia under active support of FAO.¹²

There are practical reasons for its possible wider adoption. Its sensitivity to economic incentives

10. Omer Draz , Al-Hima in the Arabian Peninsula and its Impact on Grazing Areas, Maintenance of Soil and Preventing the Movements of Dunes, " Al-Araby 221 (June 1976):52 - 59.

11. Ibid, p.58; This hima is a combination of (a) and (b) hima system.

12. Draz. op.cit. pp. 58 - 59.

is a major factor . It helps countries such as Saudi Arabia to accelerate the process of organising space. Additionally, historical factors and geographical variables have tended to encourage the application of Hima. In this way programmes for the settling of the bedouin are an integral part of Saudi policy and could eventually overcome the physical constraints.

Association between archaic methods of agrarian and economic techniques has been stressed by Jacques Weulresse, a Middle East specialist, who maintains that the geographical interplay tends to influence bedouin movements and directions. Movements, whether vertical or horizontal, depend on seasons and locational types and these, in turn, affect water and grazing availability.¹³ Neglect of the Hima system has made it clear that even when water and pastoralism were in abundant supply in Western Arabia oases and their vicinities, insecure routes and absence of government control during the Turkish regime proved to be a dangerous and prime cause for damaging vegetation and traditional agriculture. This is because the Turkish regime neither attempted to revive Hima as an economic incentive nor produce a spatial organisation consistent with the socio-economic conditions

13. Jacques Weulresse, Paysans de Syrie et du Proche-Orient (Paris : 1946) pp. 133 - 165

of that time.

Consequently, villagers and bedouins remained for centuries as the traditional economic organisation which was however unable to achieve an agricultural surplus. The common classification of the tribes in the Middle East falls into a fourfold hierarchical structure, representing the range of choice imposed by the physical conditions, as follows: (a) the long-range nomadic camel tribe of Arabia; (b) the migratory cattle tribes in Persia; (c) the largely settled agriculture; and (d) the wholly agricultural village type.¹⁴

These categories reflect two features which are superficially but misleadingly similar. One is the mode or fashion of property, e.g. livestock and the other is the type of agricultural practice. Both, however, reveal the imprints of the environment which could be substantially reduced by the hima system.

1.4.2. Vegetation

Vegetation in Western Saudi Arabia is characterised by its sparseness. The relatively long summer season; the fluctuation of rainfall from year to year and the sudden change of temperatures are responsible for

14. Stephen H. Longrigg, The Middle East, A Social Geography, (London : Gerald Duckworth & Co. Ltd., 1970), pp. 229 - 232.

both density of species and growth. Moreover, both management methods ("state of art") and the physical conditions tend to militate against development of thick vegetation.

The varieties of shrubs and herbs are a case in point.

a) Medical uses. Al-Arak is a small bush used for medical purposes including tooth brushes. Harmal is a wild shrub usually utilised for certain medical uses. Ushar is a medium-sized tree which has smooth circular leaves producing a milk-like substance. It grows in most Western areas, is used as a dental medication and as an ingredient of gun powder. Other types used for dual purposes such as hinna are utilised for medication and make-up.

b) Forage and energy. The bedouins develop their own concepts of vegetation. They group together the various types of short-lived vegetation which grow immediately after rainfall as ushb (herbs). Others which show a tolerable tendency to climate and stay permanently are called shajar (trees). The former are utilised for grazing purposes while the latter are employed for housing and firewood. Certain measures have been introduced to restore vegetation but it seems too late and too slow. Of course Figrah (in the proximity of Madina) and certain

places around Taif are covered by hima and largely escaped destruction of the vegetation.

1.4.3. Types of Farming

Farming in the Western Arabia consists of three main divisions: dry farming; irrigated land; and plantation.

a) Dry Farming: In most of Western Arabia cultivation of wheat, barley and sorghum represents the common practices of dry farming and even when a certain shift in favour of vegetables and irrigated agriculture spreads, such phenomena do not signify a radical departure from the traditional activities.

The main reasons behind the continuation of dry farming are an irregular rainfall and small land holdings. Watermelons and tomatoes are mostly based on dry farming in the west of the country and continue to compete with the large plantation farms of Qasim. In fact exports that find their way to neighbouring countries are produced mainly from this type of farming.

b) Irrigated Land: Oases of Madin, Yunbu; Wadi Fatema; and Khayber are classical examples of Western Arabia irrigated land. This type is more affected than dry farming system by recent development. Sawani (irrigation by means of animal power) and Qunayyat

(irrigation by means of qanat) have almost disappeared from most of the Western region. New irrigation methods are the common pattern in most irrigated land.

c) Plantation Type: A substantial part of irrigated land is devoted to plantation that includes grape vines, pomegranate trees and palms.

This type of cultivation tends to concentrate in the immediate vicinity of the major cities such as Madina and Makka (Wadi Fatema) which have made it quite vulnerable to certain negative aspects of economic development, i.e. expansion of the urban areas of Madina and Makka is more or less at the expense of fertile land and conversion of both Madina and Wadi Fatema waters to the urban water surplus. Urban pressure has enforced some farmers to leave the old plantations for new ones whenever water availability permits.

The development of new villages in the proximity of Madina signifies one aspect of agricultural transformation and the changing nature of farming systems.

1.5. Land Concepts and Terminological Confusion

An assessment of land concepts is essential if their contribution to agricultural development is going to be correctly evaluated. This involves explaining

sources of obscurity of land concepts and the dynamic forces affecting its recent expansion. The former have been delineated under the first section, whereas the last three sections have been devoted to the latter. The land tenure systems in an Islamic State, such as Saudi Arabia are apparently simple and obvious, based on three major concepts.

1.5.1. Various Types of ownership

Within this study the main consideration in land ownership is the evaluation of the efficiency of land tenure. Wide distribution of wealth, it has been argued, is an essential condition for economic growth, because reduction of unemployment and population drift problems cannot be solved without creating a legal system compatible with the natural incentive of ownership.

This is why enumeration of forms of tenure in Saudi Arabia became a traditional method of evaluating agricultural adjustment. Yet such classification has been marred by both imprecision and misinterpretation. Bonné and the Area Handbook for Saudi Arabia have both listed six forms of tenure. However, they are not the same. Bonne's enumeration is as follows mulk; miri; waqf; matruka; mavat and mushaa.¹⁵ The Area Handbook

15. Alfred Bonné, State and Economics In The Middle East, A society In Transition, (Greenwood Press Publishers 1973)pp.116-117.

for Saudi Arabia classification is miri; ikta; mulk; mushaa; waqf and tribal.¹⁶

Thus it is clear that Bonné's matruka and mevat have disappeared from the Area Handbook, at the same time ikta and tribal lands listed by the latter are not mentioned in the former. They differ for the following reasons: Bonné confined himself to the documents of the Ottoman Empire, yet applied his typology to Saudi Arabia, whereas the Area Handbook, although it consulted many of the same references, limited itself to the recent sources of the same country. Needless to say, their approaches affect their conclusions. Before embarking on an alternative approach, definitions of the various land systems are needed .

- a) Mulk is full property ownership.
- b) Dirha is a tribal district but within its territory emergence of mulk or absolute freehold ownership develops with time.
- c) Ikta is a gift given by the governor to an individual. Once a piece of land has been given to a person it becomes ordinary property ownership.
- d) Hima land. It means protected land in a specific time. Some Dirha is subject to occasional hima system.
- e) Musha is a form of ownership where the property is shared according to Islamic laws.

16. Walpole C. Norman C. Walpole et. al. Area Handbook For Saudi Arabia (U.S.A. Gov. Printing Office Washington D.C. Dec. 1966), p.222.

- f) Al-Ardh Al-Mayta (Dead land) is theoretically unclaimed land but in fact the state is the real owner. The State ownership, however, ceases to exist once a piece of land has transformed into live land (by cultivation or any useful utilization). Most of national territory of Saudi Arabia lies within this type of ownership.
- g) Land of public utilities includes any land under the government activities such as roads and government buildings.
- h) Waqf is dedicated land or property set aside for charitable purposes.
- i) Miri land is one of Ottoman land arrangements where the State leases land to the individual. Miri in fact is subject to further classification.

1.5.2. Origin of Ownership of land tenure

The concept of land tenure has been widely recognised. Islamic rules are the basic sources for the classification of the boundaries of ownership. Efforts, however, to achieve such a classification have not been as successful as intended. For example, the miri land system is one of Turkish land tenure which has been tailored to serve certain political means and economic ends. In Saudi Arabia, however, this system is considered to be outdated, but many still remain in a few isolated instances.

It is true that the word miri conveys an Arabic origin (yet a distorted one), and is associated with principality or the power of princes. For one thing the

land which is not privately owned in the various provinces of the country, is strictly speaking, state property. Thus even if the prince of any province is authorized to lease a parcel of land, both his authority and ownership of the land is related to the State. Similarly ikta, which developed during the early Islamic era, hardly exists in the country at the present time. That is to say both miri and ikta represent two forms of ownership which originated in the early Islamic States designed to serve certain political and social motives. As such motives have now disappeared both forms of ownership have ceased to exist.

1.5.3. Categories of Land in Islamic Law

Another source of confusion stems from the conventional methods of visualising the various forms of property holding. Ownership includes the previous six forms, yet it is a misleading conception for the following reasons:

a) It shows the land classes as if they are independent from each other. Saudi Arabian experience and practice suggest that the forms of properties are interrelated. How they are related will be explained shortly under land tenure system.

b) It does not explain how these Islamic institutions, such as waqf and full private ownership, responded to

different economic and political conditions. For example when King Abdul Aziz initiated hijrah, developing and enlarging the hima land system, he neither violated Islamic law nor aroused conflict among the tribal districts. More important, hima is one form of land tenure instituted in the early stages of Islamic Civilisation and thus became part of land tenure system. Yet, despite the fact that this type of land tenure is one of traditional techniques which rendered a great service for land use in Saudi Arabia it has been rarely mentioned in agricultural literature. One reason is inherent in hima system itself where it applies to specific area for both grazing purposes and improved pasture.

Another reason is the time element as the application of hima is limited to specific seasons during which both the grazing areas and grains' cultivation reach their maximum maturity.

So, these two reasons gave, deceptively, an impression that the areas in which hima is still operating (mostly the western parts) and the seasons are trivial from the point of view of national policy.

1.6. Land Tenure and Spatial Economic
Structure

1.6.1. Static Versus Dynamic Approach

The term "land" has broadly been utilized to include space and the permanent features which were defined by David Ricardo¹⁷ as "the original and indestructible powers of the soil"; the essence of land therefore is its natural origin and endowment. This definition is affected by cultivation where fertility and productivity are independently determined by man's activities.

Fertility of land is not solely attributed to soil, for it can be destroyed via man's misuses or conserved and developed through his intelligent uses. Since total area cannot be extended beyond the physical limited, however, the available land under cultivation can be improved or allocated for other alternatives. There is scope, though, for further land to be brought into agriculture as a result of improvements in technology. These choices depend heavily on the level of technology. This is why a total approach of land use must be viewed in a dynamic context.

As a point of departure, therefore, the old

17. David Ricardo, The Principle of Political Economy and Taxation, (Dent· London Every-Man Library, 1976), pp.33 - 46.

approach of agricultural development must be abandoned. What is the nature of such an approach and why is it inadequate?. The largely accepted view of land use is that the area under cultivation in Saudi Arabia is less than 1% of the total national land;¹⁸ furthermore, such a proportion has remained so until the present time; or slightly increased to 1.5%¹⁹

Another version of such a static approach is that agriculture is a stagnant sector. Indeed, most of the literature on land in general and in Saudi Arabia in particular tends to emphasise the total land available and the traditional methods. The danger of this approach does not lie in its theoretical concepts but it is embodied in its practical conclusions which is this: since a stagnant agricultural sector could not be isolated from the rest of the economy a 'jump' transition must occur from the low level of technology to high level and modernization.

The process of agricultural transformation in Western Saudi Arabia does not support this view. The rate of transformation is gradual and the processes responsible originated in the past, prior to the oil discovery though they have subsequently been retarded by the physical conditions of the country. In particular,

18. Walpole C., op.cit., p.214.

19. Ministry of Agriculture, Statistical Bulletin, (1970), p.17.

scarcity of water has been a tremendous handicap to transformation, yet the current investment in water resources has, in many respects, mitigated such scarcity.

1.6.2. Impact of Oil on Land Development

The revolutionary approach, that is to say, the rejection of the static approach, represents a major advance in contemporary scientific analysis of land-use and is an agricultural transformation. The revolutionary approach is historically based on the concept of the agricultural revolution experienced by Britain which rightly recognised the connections between agricultural change and economic growth. The process of change involves advancement in new crops and techniques which thus improve livestock husbandry. However, the term 'revolution' has tended to be replaced by two contemporary phenomena : (a) The 'Green Revolution', especially in regard to South East Asia,²⁰ and (b) the term 'evolution', which signifies agricultural development within the industrialized societies.²¹ The reasons for this shift in emphasis is the changing pattern of land use (in a dynamic sense) in industrial

20. Hiromistu Kaneda, "Economic Implications of the Green Revolution and the Strategy Agricultural Development in West Pakistan" Pakistan Development Review 9 (Summer 1969) pp. 112 - 143.

21. The Cambridge Economic History of Europe, Vol VI., Part II, "The Transformation of European Agriculture" pp. 604 - 673.

societies. Saudi Arabia, although not an industrial society, nevertheless shows a similar changing pattern.

Indeed, the central features of land use in industrial societies have also been reflected in Saudi Arabia and have established themselves in various forms, rising land prices being but one of them.

This last point has been widely recognised. What has happened is that after the oil industry was established a 'new' economic life developed, 'new' land uses emerged and a 'new' mechanism of the land-market evolved.

All these factors are reflected in the new type of land use which in turn has intensified the demand for land. Middlemen whose interests lie in land have responded to this demand because merchants, public servants, bankers, relatively wealthy farmers and even some graziers have drastically created 'new' conditions for land use and paved the way for bidding up land prices. On the negative side, such a phenomenon has encouraged people to drift to the cities causing shortage in rural labour supply. Severe labour shortages have been compensated for by immigrant labour from Yemen; yet this is a short term adjustment which might lead to disastrous consequences in the long-run now that the Yemenis are returning home.

On the positive side, high land prices tend to attract more investment in land and encourage further intensification of land use. The net result is that the area of cultivated

land would be increased by utilising those areas which are not being worked to their full intensity.

Moreover, Western Saudi Arabian farmers were experiencing a poor marketing system which persisted until the oil revenues altered the structure of the economy and made the present national transportation network possible. The farmers used to pile up their agricultural products during harvesting seasons which involves selling at a relatively low price. This is particularly true in the case of most perishable goods : vegetables and fruits of Madina and Wadi Fatema, e.g. grapes, tomatoes and watermelons. Lack of accessibility, which has imposed tremendous constraints on agricultural transformation during the past centuries has been mitigated. Before trucks and lorries, fresh dates and grapes of Madina were almost unknown to Jedda consumers.

One favourable result of oil impact on land development is that the present market structure is gradually facilitating the processes of transformation via altering the market's capacity to absorb more agricultural products. Despite these improvements, however, there is still an inadequate national road network to secure regular movements of agricultural produce from producers to consumers. This situation can be improved through better market facilities for livestock and adequate

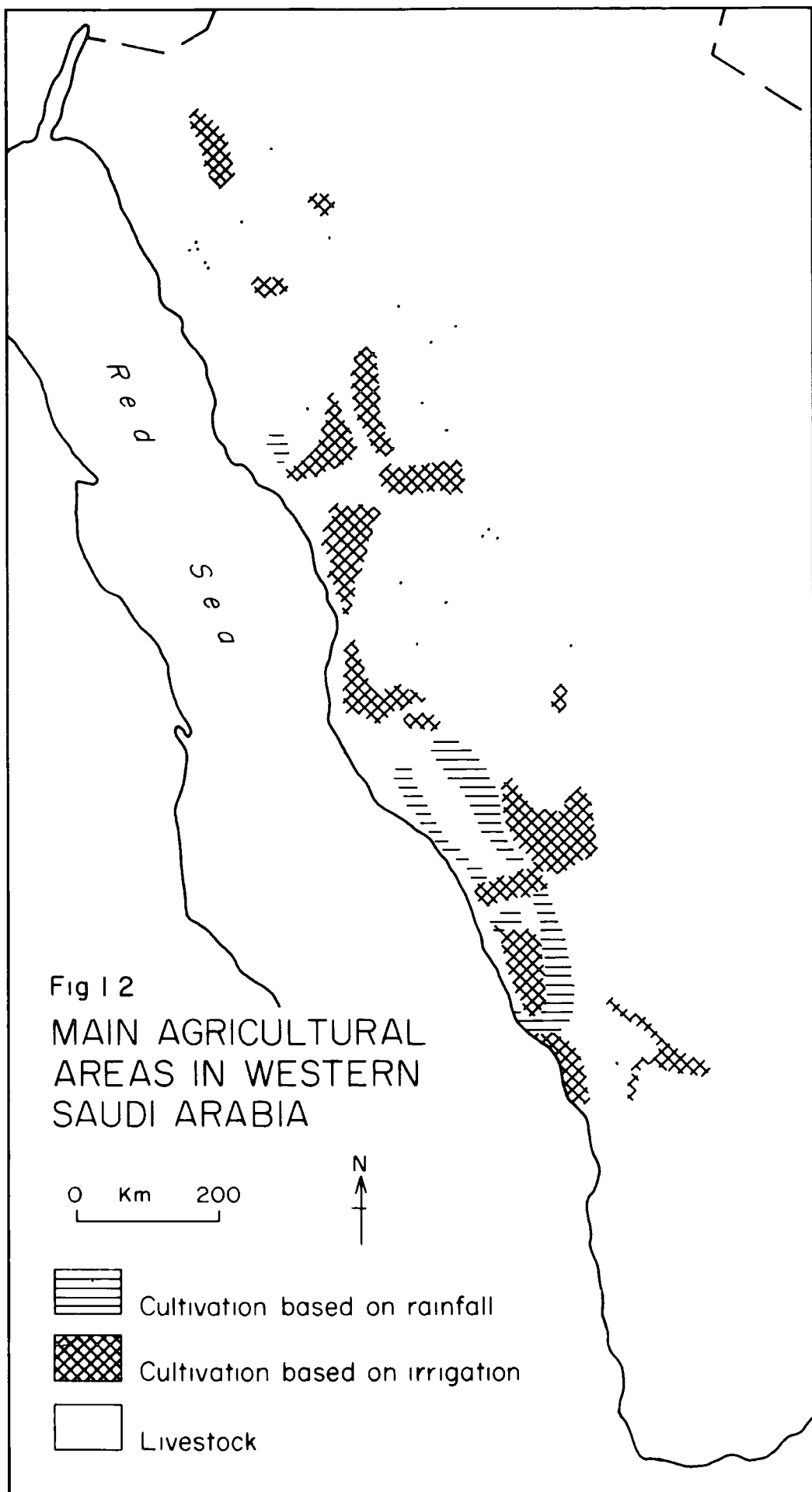
refrigeration for perishable products.

Another area which needs more attention is to strengthen the market base on two fronts . income distribution and co-ordination of marketing channels. In other words, the need for a properly defined distribution system is clear, otherwise farmers will be unable to take full advantage of the rising general income. For example, surplus fruits and agricultural products from Abha rarely reach the main cities because of inadequate transportation which is a typical example of some parts of the country. Some farmers have left their land not because of climatic constraints or because of low productivity but because of remoteness which tends to determine both human activities and land use. Both interaction of spatial location and human decisions, between them, determine land value and the pace of agricultural transformation. On the one hand, transportation of agricultural products from certain parts of the country to the major cities has proved inadequate, due to congestion, whilst, on the other hand, the farmer's decision processes are dynamic factors affecting the kind of produce and scale of production. Such processes are unlikely to develop unless the accessibility of market can lend itself to the agricultural structural change.

Improvements in quantity and quality of agricultural products have been reported by World Bank and F.A.O. studies but the lack of storage and refrigerators dictates poor marketing conditions. Excellent fruit quality exists in various regions, however, but such quality suffers from improper handling at different stages of the market process. Intensity of heat and remoteness are negative aspects and largely responsible for diminishing both quantity and quality.

These factors are major reasons for making the processes of change slowly and gradually because the expansion of the local market depends, among other things, on local entrepreneurs who can transfer the agricultural products to the large villages and other cities which are the catalysts for transformation.

Difficult physical conditions and uneven distribution of natural resources have created a considerable locational concentration, and have contributed to patterns of dispersion in Western Saudi Arabia. Examples of such patterns are obvious in cultivated areas where the major determinant has been the location of water, Fig. 1.2. Examination of links between geographic concentration on the one hand and economic activities on the other may enable an assessment of land tenure relatively close to the actual situation in Western Saudi Arabia to be made. This



Source CDS, Statistical Yearbook, Vol. 6 (1970).

implication is reinforced by the following factors : water potential; development of traditional routes; pilgrimage and the geographic position of the Holy Towns.

1.6.3. "Water Potential"

Water supply is a determining factor for both land utilisation and land value. Yet the existing water supply is not only governed by annual precipitation but also by the processes of evaporation. Furthermore, present knowledge regarding underground water is hardly perfect. Although since the 1960's certain parts of Western Saudi Arabia have been subject to constant study, the accumulated knowledge in this regard is incomplete and open to serious doubt. The private sector, i.e. individual farmers, is still relying on traditional methods of water exploration and they are sometimes reluctant to follow the advice of experts. This unwillingness of farmers, in Figrah and Abha at least, stems from a few instances there in which the recommendations and conclusions of the experts regarding existing underground water, proved to be faulty or imprecise.²² Moreover, the authorities are suspicious on different grounds : technical reports tend to take a relatively long time before their results are finalised beyond doubt.

22. Interview with the Unit Agricultural Manager in Madina

Such uncertainty is due to the fact that the areas covered by survey represent only a fraction of the huge national territory (2,200,000 km²). Moreover, contracts with international firms require a great deal of time before survey and explorations take place.²³ These factors are responsible for variations in land prices and speculative developments which, in turn, tend to encourage geographical concentration in certain areas. Concentration of agricultural activities on both sides of the Hijaz mountains, Fig. 1.2. is an illustration of this.

Inspection of Fig. 1.2. suggests the following : firstly, there is a relative concentration along the fringe of the Red Sea which increases towards the south-western Hijaz and decreases towards the east. A combination of geographical factors and economic variables underlie such patterns, i.e. the distribution of agricultural activities in this manner implies uneven distribution of natural endowments and economic characteristics. More important, the geographic concentration tends to follow the location of water supplies and affects the direction of traditional routes.

1.6.4. The Development of Traditional Routes

The evolution of roads in Western Saudi Arabia is

23. Kingdom of Saudi Arabia, Saudi Arabia Monetary Agency (1970) pp. 32 - 33.

another factor contributing to a relative concentration and slow agricultural change. Indeed, the present transportation system has undergone three developmental stages : firstly, internal natural routeways, then pilgrimage routes and finally, the present modern roads. (Figs. 1.6. 1.5. Res.).

Since internal natural routes are of little importance to agricultural transformation their main features may be dealt with briefly. This type of route includes passes through mountains and paths within mountains and valleys. For example, the mountains of Abha and Figrah possess internal roads which connect agricultural sites with the traditional villages. Other forms of internal roads are routeways leading to grazing areas and water locations.

1.6.5. Pilgrimage and the Geographical Position of the Holy Towns

Internal roads and pilgrimage routes have certain factors in common, for both were used to facilitate flows of goods and services to the Holy Towns and to Jeddah, and both lost much of their significance when the camel was replaced by the car. Yet both offer a partial explanation for the spatial structure of Western Saudi Arabia. Internal routes served the remote areas and were associated with the dispersed pattern of agricultural activities, while pilgrimage routes tend to be associated with a relative concentration, with an increasing tendency over time as Table 1.1 reveals.

TABLE No. 1.1.

Pilgrims from Abroad, 1936 - 1976

<u>Year</u>	<u>Total</u>	[*] Index, 1955=100
1936	49,517	
1940	9,024	
1945	37,636	
1950	107,652	
1955	232,971	
1956	215,565	109
1957	206,403	108
1958	204,403	108
1959	266,100	115
1960	285,948	123
1961	216,455	93
1962	197,144	85
1963	260,284	112
1964	283,319	122
1965	294,118	126
1966	316,226	136
1967	318,507	137
1968	318,147	137
1969	374,789	160
1970	406,295	175
1971	479,339	206
1972	645,182	277
1973	607,755	261
1974	918,777	395
1975	894,573	384
1976	719,040	308

Source Compiled from Saudi Arabia Monetary Agency for
the Years 1957 - 1975 and Ministry of Pilgrimage
and Waqf, 1976.

^{*} This Index has been added to show the growth rate in number
of pilgrims.

Such a transportation system not only underlies the present Western Saudi Arabian modern road network but also has produced the present spatial economic structure. Moreover, the growth of pilgrimage routes not only illustrates the nature of the connection between the Holy Towns and their economic dependence on each other, but also forms a dynamic factor in shaping the spatial economic structure of Western Saudi Arabia. Ibn Khurradhben is one of the Arab geographers who realised the significance of routes and way-stations among the Hijaz towns and their connection with outside world. He enumerated fourteen routes that connect Madina with the Northern Hijaz, and other routes from both the east and the south of Madina.²⁴ Though he hardly goes beyond enumerating them and describing their geographic characteristics which affect the inland routes leading to Madina, Jedda and Makka, his traditional writings provide a comparison of the changes in the fundamentally contrasting spatial economic structure of the past and the present. From this, by examining Fig. 1.1. and Fig. 1.5. the following geographical economic characteristics emerge:

Firstly, imagining Saudi Arabia as a triangle, the three major cities are located almost at the middle of the side of the triangle forming the Red Sea. This

24. Ibn Khurradadhben, *Al-Masalik wa Al-Mamalik*, (Vol. 6. (Leiden, 1889) pp. 148 - 151.

triangle has a long base and a relative broad width, i.e. extending from the extreme south of Abha to the extreme north of Saudi Arabia (Aqaba). Routes between various parts on the eastern Red Sea run parallel to the Hijaz mountains and the pilgrimage routes not only encompass most of agricultural areas or economic activities but also contribute to the width of the triangle base.

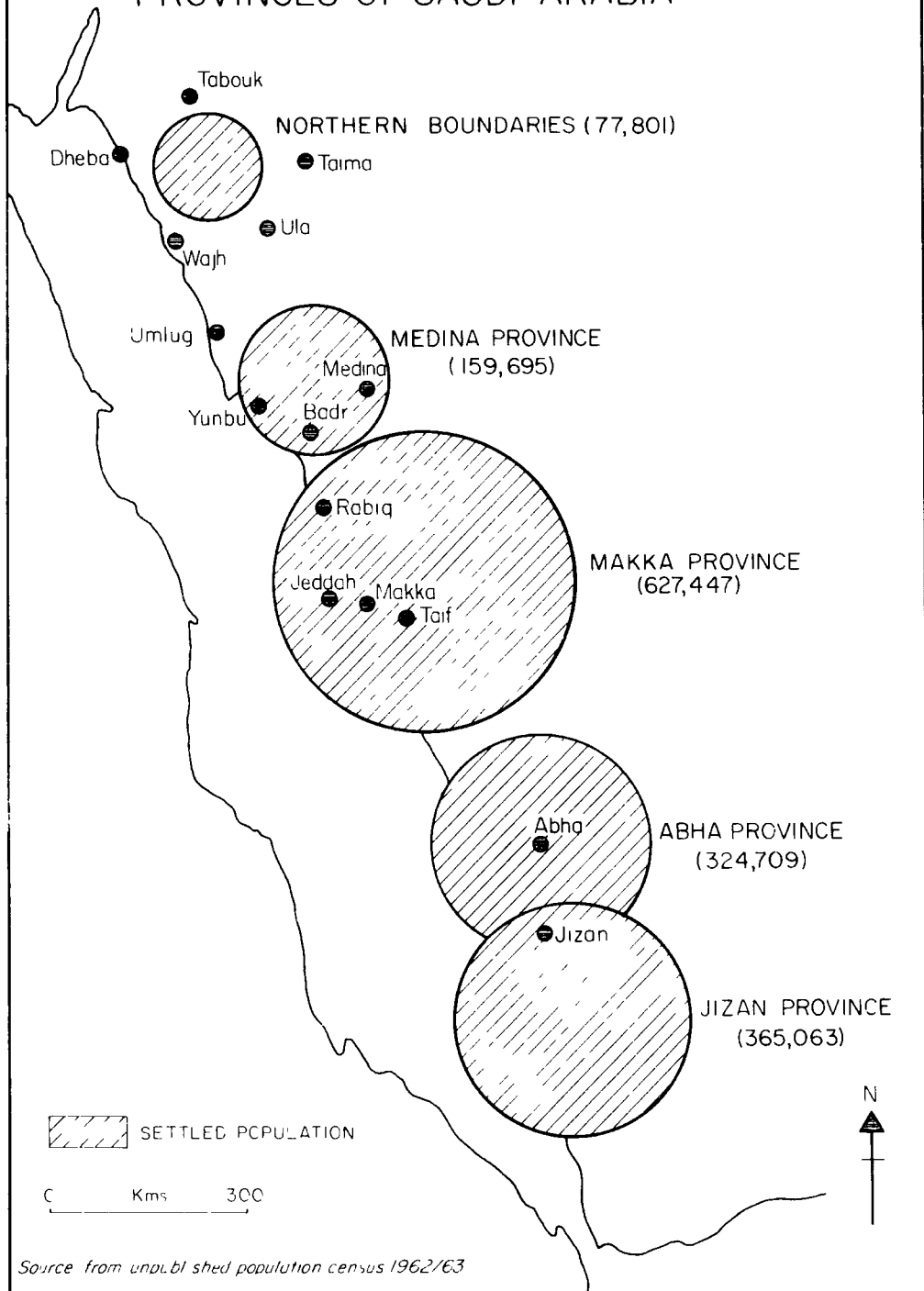
Secondly, the head of the triangle is located very nearly at Riyadh and its environs. Furthermore, despite the long distances separating the head of this triangle from the locations connecting various parts of its base, it is obvious that Western Saudi Arabia occupies a comparatively advantageous locational position with respect to other parts of Saudi Arabia;

Thirdly, as Fig. 1.1. Fig. 1.4 and Fig. 1.5. show, the development of roads within and around the base of this triangle represents economic arteries and relative population concentration.

1.6.6. Modern Road Development

Despite the fact that total national length of roads is really relatively small and has not yet removed the psychological effects of remote areas, it is growing at a satisfactory rate which is compatible with the transitional phases of the country. The length of national main roads

Fig 13 POPULATION OF THE NORTH & WESTERN PROVINCES OF SAUDI ARABIA



amounted to 3600 km in 1964 and reached 8967 km in 1973 whereas agricultural roads were 1097 in 1973 as Table No. 1.2. shows. Growth of roads not only serves as a concomitant to agricultural transformation but also makes possible an effective release from physical constraints. It is true that Saudi Arabia is neither a net exporting country nor even a self-sufficient one; yet nevertheless, the processes of transforming traditional agriculture started in the early twentieth century, while recent development in the transportation net has helped to accelerate such processes in two major ways. Pastoralism and sedentary cultivation have tended to integrate themselves and connect tribal districts with towns and oases as shown in Fig. 1.5.

1.6.7. Population Pressure on Land

Migration to towns from tribal districts and the countryside is not only giving rise to pressure on land, but also contributing to increasing demand for food which in turn tends to generate a continuing vicious spiral. One evidence of this situation is the population distribution in Western Saudi Arabia as Fig. 1.3. indicates. This distribution reveals the intensity of population pressure, particularly between Yunbu and Jizan.

The population concentration seems to coincide with agricultural areas, both livestock and traditional

TABLE No. 1.2.

Progress of Road Construction from 1963 - 1973

Year	Main Roads		Agricultural Roads	
	Total	Completed during the year	Total	Completed during the year
1963/64	3600	180		
1964/65	3715	115	1500	
1965/66	4744	1029	1700	200
1966/67	5700	956	1950	250
1967/68	6813	1113	1992	42
1968/69	7654	841	2786	794
1969/70	8021	367	3739	953
1970/71	8323	302	4000	261
1971/72	8614	291	4601	601
1972/73	8967	3353	5698	1097

Source: Kingdom of Saudi Arabia, Central Department of Statistics, Statistical Year Book Tenth Issue (1974), p.267

farming such as wheat and vegetables. Furthermore, despite the unreliable data on which Fig. 1.4. is based, the recent census tends to confirm the general trends as produced in Fig. 1.4. These trends make themselves felt in three ways .

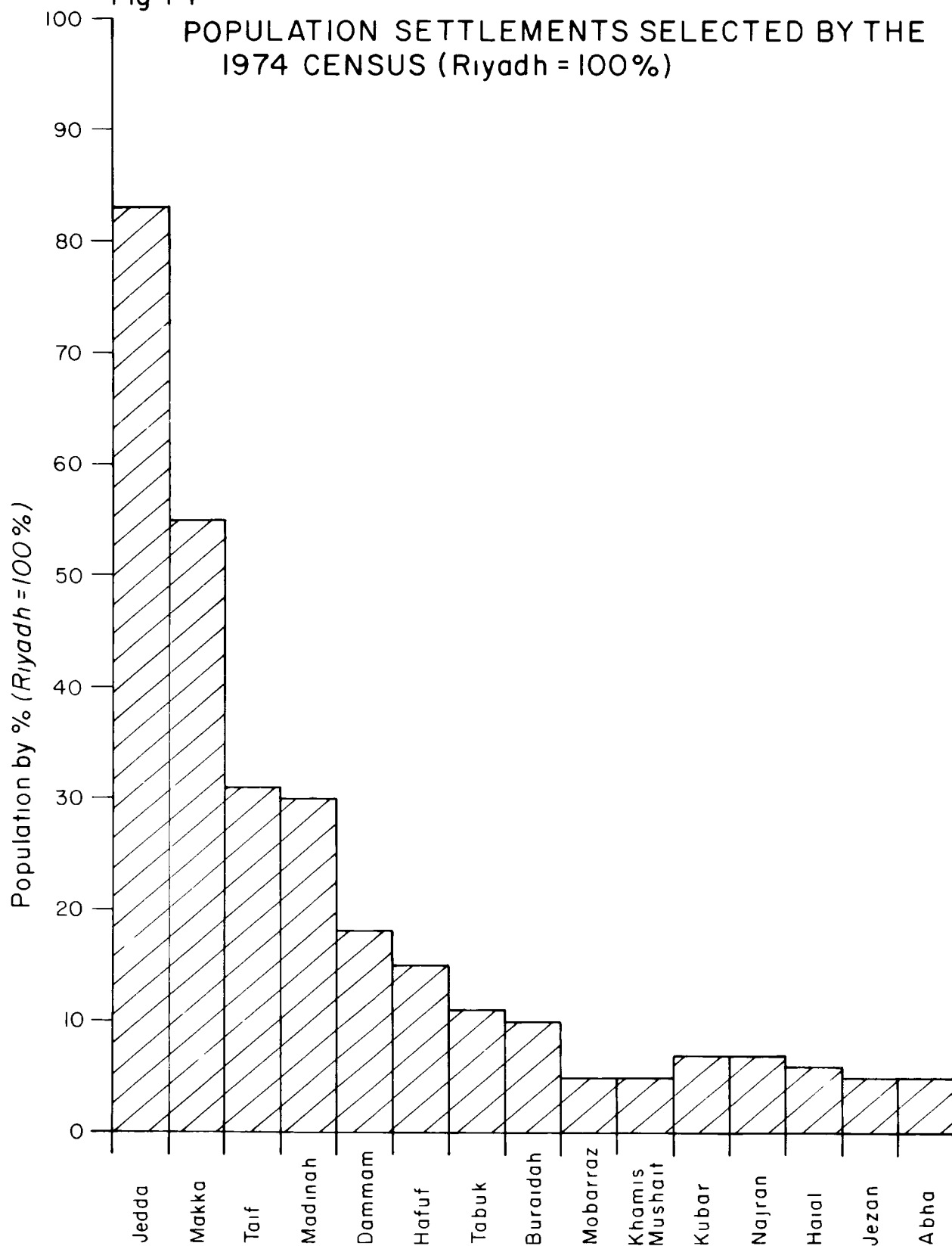
First, the old land tenure of share cropping has disappeared in some areas such as Yunbu, Wadi Fatema, Madina and Wadi Safra. Second, shifts in agricultural locations have developed due to the waves of migration, examined in this study, which have accompanied by gradual alteration of traditional agricultural practices, shifting from livestock to vegetables. Third, land uses have undergone noticeable changes particularly in the area of urban and public uses in the major towns such as Madina and Jedda.

Until 1960 the residential areas of Madina were confined to the space within the town walls, i.e. an old Turkish fashion where the town is usually enclosed by a long thick wall with few gates leading to residential areas. Growth of population is taking place inside and outside the town. As a result the spatial structure of Madina has altered in various directions and previously cultivated land has turned into residential areas.²⁵

25. Mohamed S. Mecci, Aspects of The Urban Geography of Medina, Saudi Arabia, (Unpublished M.A. dissertation, University of Durham, U.K. 1975), pp.131 - 134.

Fig 14

POPULATION SETTLEMENTS SELECTED BY THE
1974 CENSUS (Riyadh = 100%)



Furthermore 64.23% of Madina's population has come from outside the town, i.e. rural areas and the tribal districts.²⁶ Growth of population in Jedda has undergone similar processes in terms of expanding residential areas and the pattern of land use. Some rainfed areas have been converted to public use and residential places. Growth of Jedda's population between 1946 and 1974, as Table 1.3. reveals, has involved sudden increase and subsequently pressure on land similar to that of Madina in both spatial structure and the altering of traditional agricultural practices.

TABLE No. 1.3.

Population Growth in Jedda between 1946-1974

Year	Population	Increase		Percentage of annual growth
		No.	%	
1946	60000			
1959	110000	50000	83.3	6.4
1963	148000	38000	34.5	8.6
1971	381000	233000	157.4	19.8
1974	561000	180000	47.4	15.7
Total		501000	835	29.8

Source: Robert Matthew, Al-Haikal Al-Iklimi, Ministry of Interior, Municipalities Affairs, 1974 p.7.

26. Robert Matthew, Al-Haikal Al-Iklimi, trans.regional skeleton, Ministry of Interior Municipalities Affairs, Riyadh, 1972, p.18.

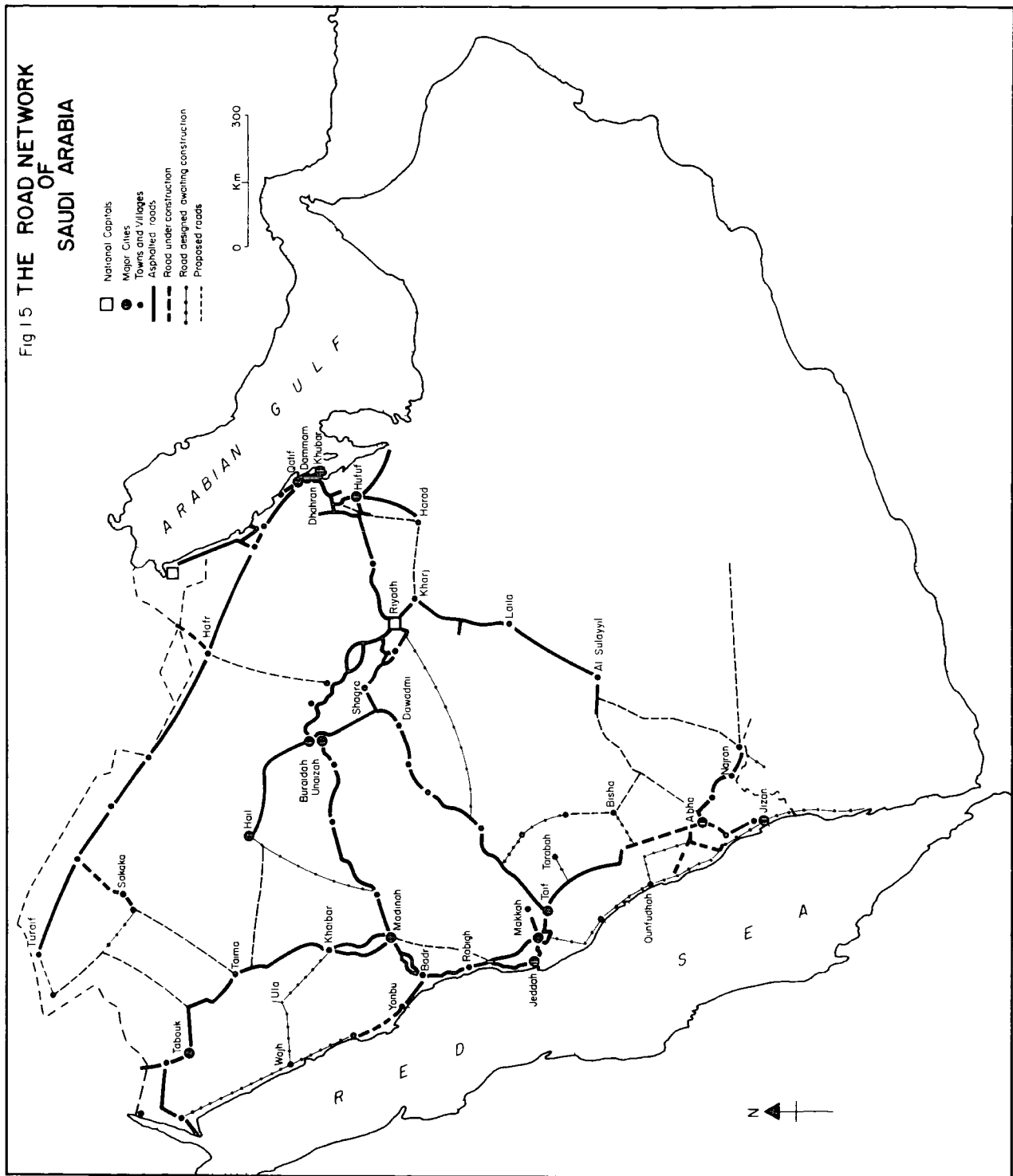
Fig.1.4. shows that Jeddah and Makka occupy the second and third position after Riyadh whereas Taif and Madina are ranked in the fourth and fifth positions. Furthermore, this pattern of concentration implies two factors, i.e. changing land use and rising land prices. In consequence public management of land has developed on two fronts : Ministry of Agriculture and the Centre of Town Planning. Obviously these institutions are designed to regulate land use in urban as well as in agricultural land. For centuries these functions have been left to the Islamic courts, and even when certain functions are overtaken by these new institutions the final decision is invested in the Islamic Courts. Even the regulations of such public institutions are valid only in the context of Islamic land tenure. The new institutions as well as the increasing areas of Government intervention represent responsive measures to recent changing economic conditions.

1.7. Land Tenure System and Economic

Incentives

What makes one land tenure more effective than another is not only its being a part of the economic system but also the extent of its contribution to modern agricultural development.

Fig 15 THE ROAD NETWORK
OF
SAUDI ARABIA



1.7.1. Public Management and Private Ownership

Islamic institutions are ways in which the state regulates tenure and tenancy. What, however, is meant by land tenure?. As already implied, land tenure can be defined as the whole set of rights and patterns of both resource utilization and land use.

Mulk or full private ownership is one major pattern where the sacred law rather than civil statute law underlines its principles. The set of rights and obligations derive their force from such Islamic institution (mulk). Thus the state can only interfere when these rights are endangered. For example the government of Saudi Arabia cannot change this form or appropriate land, except for public utilities after generous compensations because it is protected by Islamic law. It interferes only as a protector. This is what gives the farmer great security. Furthermore, security and protection have been instituted by purely Islamic law which the state is part of.

a) Mulk embodies economic incentive which is subject to market self-regulation and economic rewards. It is through such rewards that the government can act to induce the bedouin to accept its agricultural policy.

b) Waqf is another Islamic institution designed to serve a similar purpose. Although Waqf land is dedicated to religious institutions and charity the rights and

obligations are based on economic incentive. Bonn  is one of the scholars who appreciated economic incentive behind waqf:

The insecurity of land property, which was particularly exposed to confiscation on the part rulers, provincial despots and feudal chiefs, led to an ever-increasing conversion of privately-owned land into waqf land in order to assure the owner or his family the usufruct of the property.²⁷

Yet, he concluded that although the institution of waqf had fulfilled a great mission it has now become "obsolete and superfluous."²⁸

Indeed, experience of certain Islamic States, including Saudi Arabia supports his conclusion, because of waqf mismanagement and the creation of unearned incomes. People were getting a permanent income without any contribution to national economy.

Perhaps this is one reason why the Saudi Arabian Ministry of Pilgrimage and waqf took over the waqf Administration early in the 1950's. This Ministry published the first estimates of the number of waqf units, which shows the percentage of total agricultural units in waqf as follows : Eastern Province and Nejd, 15%, and Hijaz, 10%.²⁹ It is not yet known whether such percentages

27. Bonn  State and Economic in the Middle East, A Society in Transition p.120

28. Ibid.

29. Kingdom of Saudi Arabia, Waqf Authority, Unpublished Report (1959).

are private waqf or proper waqf. The proper waqf is devoted to religious institutions whereas private waqf is for individuals. Most of waqf in Madina which exists as farm units is, however, of the 'proper' type. Farm waqf (in Madina and Yunbu) generally seem progressive and productive in contrast with waqf buildings where ruin and carelessness are their main characteristics. Other problems however exist in the farm waqf, particularly as division and subdivision of property tend to weaken investment incentive.

A distinction must however be made between waqf management and waqf as an institutional arrangement. Mismanagement is an inadequate criterion for assessment or evaluation of the waqf system, because inefficiency of management is common to all the systems of land tenure. The literal meaning of waqf is to halt the transfer of property. Waqf is therefore a financial measure intended to prevent property from circulating by buying or selling. Thus waqf takes the form of a financial asset which as an investment is a good device for capital accumulation. This is particularly true in the case of Saudi Arabia where there is a tendency for people to live beyond their means. Waqf freezes assets and prevents extravagant consumption.

Musha is another form of ownership which is probably more misunderstood than any other type of property

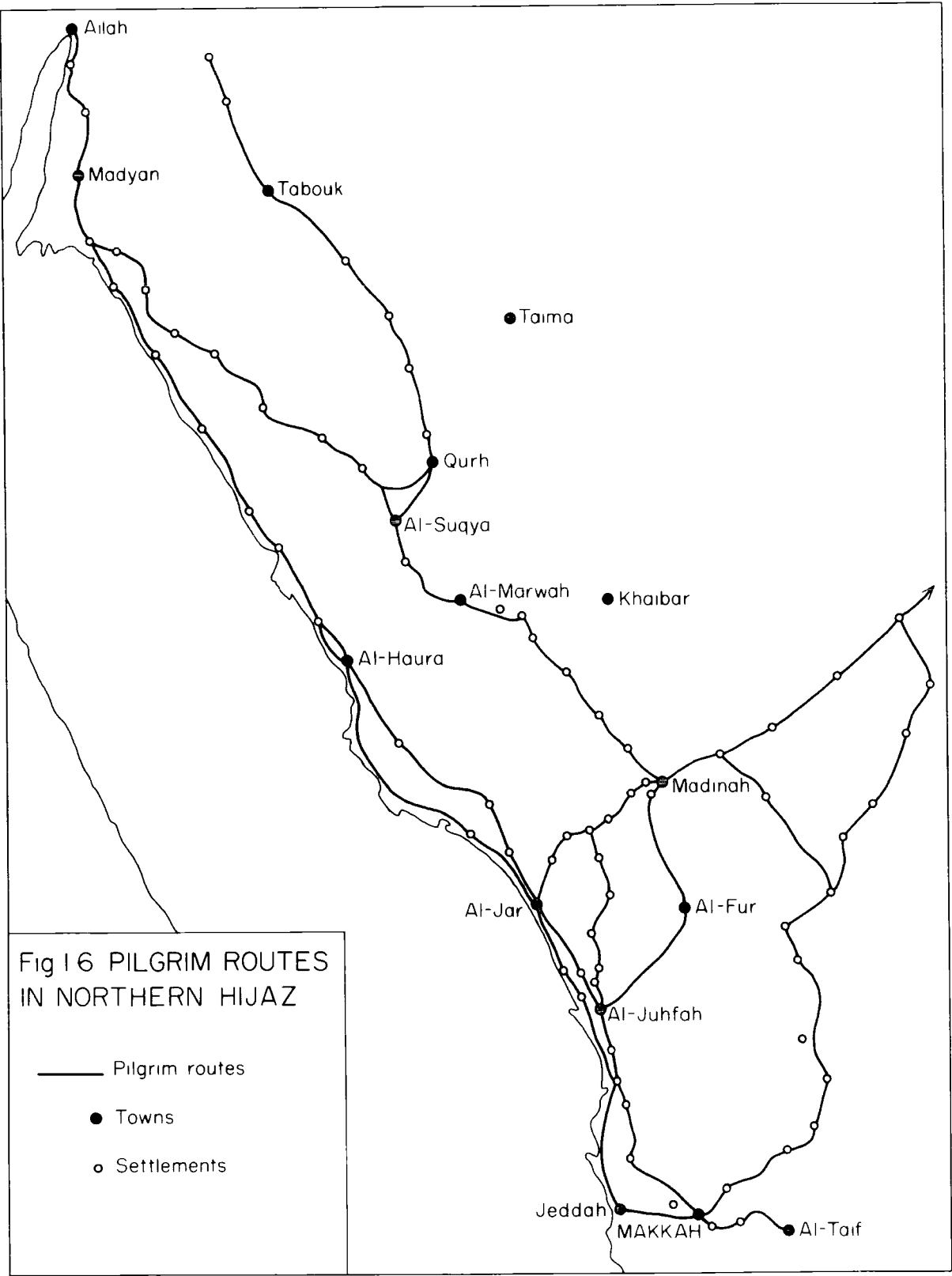
holding. Confusion mainly arises from the meaning of the word musha. It is true that musha land is collectively-owned property but such property has no boundary. That is why musha is generally described as collective land ownership which does not seem a precise definition of Islamic law of musha and other properties.

1.7.2. Property Aspects of Islamic Land Tenure

A distinction should always be made between property as an asset and its utility, i.e. a quality of such asset and services. It is similar to the concept of the rent of a house and its ownership where the rent is paid for its utility. Thus selling and purchasing is confined to the utility in the form of sheltering, grazing, irrigating. Furthermore musha means that such utility is spread everywhere in the asset, regardless of whether there are horizontal wells or grazing areas.

Khayber is usually cited as musha land owned by Bedouin tribes but this example and similar situations of land tenure in the Fertile Crescent have deceptively given a false impression that musha is a transitional stage of collective ownership:

Musha ownership which is limited to the rain-fed cereal zone represents a stage of transition between the completely communal property system of the semi-nomadic tribe of the desert borders



Source After A. Al-Wohaibi.

and the completely divided property system which exists in the settled zone along the coast line. Its basic idea, the communal ownership of land, is clearly tribal in origin.³⁰

One wonders why mere adoption of a certain form of property signifies a transitional stage. Western Saudi Arabia experience suggests that the manner in which the various types of ownership have adapted under Islamic laws occurred independently of economic stages. Thus, musha is neither a stage of transition nor tribal in origin. It is a purely Islamic form of ownership which can be used in any time or place, including the ownership of cars, ships and camels. Hima, which is an old-fashioned type of ownership, is a case in point. It developed at the beginning of Islam yet is still a common practice nowadays in Western and Southern Saudi Arabia. It is true that Khayber is jointly owned by bedouins and, to quote the Area Handbook of Arabia, people of Negro descent.³¹ Yet the system of land tenure in the Khayber Oasis has not changed since such ownership was created at the very beginning of Islam, and might well continue into the foreseeable future.

Unlike mulk and waqf, musha tends to discourage economic incentive because the absence of definite

30. Charl Issawi, the Economic History of the Middle East 1800 - 1914 A Book of Readings (Chicago: The University Press, 1966), , p.75.

31. Walpole The Area Handbook for Saudi Arabia, p.220.

ownership created serious problems for modernizing musha property. Of course purchasing and selling can take place but the asset itself remains musha. Indeed this is the case in Khayber during date harvest where booming business characterised the oasis.

Similar to musha is the concept of dira which is a tribal district. It is the creation of a custom unlike musha which has been created by Islamic law. The beneficiaries in the case of musha are persons and families whereas in dira the beneficiaries are clan and tribe as well. Similarities lie in the well-defined line between the property and the utility embodied in the form of property. For example every tribe has its own loosely defined territory, yet it has no right whatever to prevent another tribe from grazing or watering. It is true that dira concept tends to encourage tribal dispute yet the absence of a sharp line between individual ownership and his tribe tends to mitigate tribal conflict over grazing areas.

The rise of the modern state imposed further restrictions on dira and tribal territory. Furthermore, the state can use its invested power to limit the dira territories because it is created by custom, whereas musha is of Islamic origin. In fact, the growth of villages in the country together with the influx of bedouin makes dira less important in Saudi Arabia today.

Another factor behind declining importance of dira is the changing economic conditions. Income scale and consumer's taste made the utilisation of such traditional methods, namely dira, almost impossible.

1.7.3. Tenancy and Water Rights

In all the previous forms of ownership in Saudi Arabia so far mentioned, the land can be leased. Types of lease, however, are subject to agreement between landlord and tenants. The sharecropping system is one arrangement where landlord provides capital, such as equipment, water and fertilizers. The tenant supplies manual workers and receives a specific percentage ranging from 50% to 33% of crops depending on the crop and the agreement. How many land units are under sharecropping system in the country is not known, but they are estimated at between 50% and 80%. ³²

It seems, however, that sharecropping only fits the ein qanats (again canal or horizontal wells) irrigation system which has almost disappeared. "Muzarah" and "Musaqah" are two irrigation systems which still exist along Figrah mountains and villages around Madina.

Muzarah is a special Islamic arrangement. It is a contract between landlord and the farmer where the latter

is responsible for land cultivation and other works until the crops reach its natural perfection of ripeness then he gets specific share of such crops.³³ Musaqah, on the other hand, is a contractual arrangements resembling muzarah in a sense that the farmer is responsible for the cultivation of palm trees and vines; he gets a specific proportion of dates of fruit at the time of harvest.³⁴ Of course both systems have rendered a great benefit when agricultural credit does not exist. This importance, however, has diminished when the Saudi Arabian Agricultural Bank mitigates the shortage of credit or money supply.

1.8. An Appraisal of Saudi Arabia's
Land System

Some environmental constraints and the basic land systems have been examined. The former tend to determine types of agricultural activities, while the latter is designed to organise such activities. As environmental factors exert almost irresistible pressures on farmers and bedouins the area of choice tends to shrink. Yet unmistakeable perception of their environments has produced a sort of suggestive geographical gazetteer which reveals

33. Hossein Ali Al-Azami, Ahkam Al-Ougaf, (Baghdad: Al-Ittihad Publishers 1949), p.177

34. Ibid.

their consciousness and underlies their action in agricultural fields.³⁵ These problems have been delineated in such a way that might indicate the course of agricultural policy. For these reasons the circumstances which contributed to ambiguous and confusing nature of land tenure system have been examined. Land tenure rules are based on Islamic law which in turn determine the form of land ownership. This might suggest an extreme rigidity, especially when the economic and social problems entail national intervention, and inability of the system to respond to new developments. One cannot generalise because Islamic law is subject to various interpretations both intellectually and practically.

Experience in Western Saudi Arabia, however, suggests a remarkable flexibility underlying land tenure systems. In addition to the previous analysis, three examples can be cited:

a) Hima is one traditional technique which has been developed, and perhaps escalated in the Hagra's era, to regulate land use and to put natural vegetation into maximum use, it is a common practice at the present time along the Hijaz mountains;

35. Supra, pp. 6 - 8.

b) Water distribution, maintenance and supervision systems are based on a combination of Customary and Islamic law. Despite the fact that water rights have to be strictly limited to land possessing these ancient rights, such limits did not prevent the surrounding land from practising sustained irrigation.³⁶ Furthermore, market forces and water availability determine the price of water and its allocation in reasonable efficiency.³⁷ For example, at Yunbu and the Wadi al Safra, water issuing from springs was used to irrigate palms throughout 24 hours of the day. At no time was the flow left to go to waste. This system continued until 1950 when those canals dried out. It sadly became a matter of history and both land tenure and water ownership systems disappeared after hundreds of years of efficient supervision of water and land management. F.A.O. summed up such efficiency: "with a good flood an area of 2,000 acres is sufficiently well soaked within 24 hours."³⁸

c) The present growth of private ownership as a resultant of rising prices for agricultural products.

36. A.M.A. Maktari, Water Rights and Irrigation Practices in Lahj, A Study of the Application of Customary and Shariah Law in South-West Arabia (Cambridge: The University Press, 1971), pp. 49 - 94.

37. F.A.O., Water Rights in Wadi Yanbo, (Rome: 1954), pp. 75 - 77.

38. Ibid., p.76

Statistics which show such new developments are absent or more commonly a matter of mere estimate, yet growth of new villages and securing agricultural surplus in vegetables are obvious evidence of land tenure's positive response to economic development. This is, however, not to say that land system is free from certain deficiencies, but to show that extent of its flexibility and ability to influence social attitudes.

More important, there are certain less industrialised nations where economic and social problems are pressing for land reform which might require breaking with the past. Saudi Arabia in general and its Western parts in particular are lucky enough to maintain the present land tenure system because it is consistent with national character and highly sensitive to new investment which might make land development and expansion possible.

C H A P T E R T W O

Labour Constraints and Agricultural Change

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2. Determinants of Bedouin Attitudes Towards Work:

"Cultural Bias"

Introduction

This chapter examines labour problems, stressing two major factors: cultural traits of the Arab and trends in migration. Sections one and two attempt to delineate determinants of labour attitudes towards work and the structure of the economy from which labourers might eventually be transferred to modern agriculture. Sections three and four deal with development of exchange economy and types of the labour migration. Sections five and six examine traditional agricultural change and the labour market.

It is doubtful that genuine transformation of agriculture in Western Saudi Arabia can be achieved without qualified persons possessing a full understanding of Arabian cultural traits underlying the labour force. This is because the problems of raising agricultural productivity in this region can not be attained merely by designing measures of planning in isolation from dynamic problems of transitional society. Before examining such circumstances the term 'labour' needs to be defined. It is used here in a broad sense to include the potential labour force of people who are willing and capable of working either for pay or as self-employed.

The problem of labour shortage is in reality, a range of related problems. It has a number of dimensions. First, cultural traits affect labour attitudes towards work and tend to create socio-economic conditions hardly conducive to agricultural development. Second, development of exchange economy not only enfeebles the bedouin economy, but also tends to transmute the traditional agriculture into a commercially orientated one. Thus the two socio-economic characteristics produce two types of migrations with different consequences, i.e., tribal migration perpetuates low levels of agricultural productivity and resistance to rapid adaptation to new ways of cultivation; in contrast transitional migration, which while still in the stage of adjustment, seems to be a promising phase.

2.1.1. The Tribal Structure

A shortage of labour in Western Saudi Arabia, as well as the kingdom as a whole, is one of the persisting problems facing agricultural development. The present author believes that key solutions lie in understanding the bedouin attitude towards work and cultural pattern.

The bedouin attitudes are introduced here to comprehend the extent of intelligence; physical vigour and finally the prospects of developing manual dexterity.

An appreciation of the bedouin's attitudes towards work is vitally important to agricultural transformation. This is because the transitional phase from the nomadic life to sedentary life involves a complete shift from traditional activities to the growing complexity of urbanization.

That is to say, the economic structure, the concept of the wealth, division of labour and the actual attitudes dictate new patterns of life and effective adaptation. For instance, the oil injection into the Saudi economy created tremendous employment opportunities in the modern sector; yet, the bedouins refrained from any economic activities which they considered against their dignity. But, why do the bedouins look down on manual work? This chapter is devoted to answering such questions. Suffice it is to say, in this context, that the type of work which attracts them more than any

other is an important signal which might reflect their actual attitudes. For example, the Saudi Arabian bedouins prefer to work as drivers and select other similar jobs with reduced wages. Economic returns and monetary rewards are neither the criteria nor the standards which determine the bedouin attitudes towards work. So, such rewards are poor factors for bedouin inducement. Why do the bedouins consider the driving of vehicles to be prestigious? There is a common belief among them that the motor car is not only an excellent substitute for the camel but also a symbol of traditional strength.

To be more specific, the bedouin looks down on manual work because he has developed certain values and norms which constitute traditional ideals and virtues, without which he is hardly considered an effective member in his society. In order to become effective, from the tribal point of view, the bedouin must fulfill certain social functions involving risks. His decision to work is not solely governed by his immediate family needs, but also with traditional explicit approval. Instances of such attitudes are several. The bedouin's decision to become a driver arises from his own evaluation of the bedouin virtues, such as being a protector of his tribe, or its guard, where one can carry arms.¹ This is because arms and guards represent the bedouin spirit of traditional life; furthermore, this way of life is preferable to them as it distinguishes them from the

1. Makki Al-Jamil, Al-badawah wa Al-badow fi Al-Belad Al-Arabiyya Derasah li ahwalahom Al-Igtemaeh wa Al-Iqtisadiyyah wa wsaal Toteenahom (Beirut: Serse Allayan, 1962), pp. 20-24.

sedentary man on which he looks down.

Indeed, certain events influenced the tribal structure and attitudes; the remarkable impact of oil on the bedouin life in Saudi Arabia is not confined to urban contact, semi-luxuries, beverages, radios, etc. It is reflected in two related ways: growth of the cities is one of them, where more than 70% of the inhabitants are bedouins.² Diffusions of education is another consequence of oil: yet both factors have failed to create positive attitudes towards work. Logically, in the first stages of nation-building hijra, education is not job-oriented, it is rather anti-illiteracy. This point will be examined more fully later, so it is enough to mention here that the connection (which has been sadly overlooked) between the two decisive events: hijra's escalation and oil discovery, have irrevocably upset the bedouin life-pattern.

Hijra, on the one hand, involved a special phase of reorganization, whereas the oil impact initiated obligatory re-adjustment. These events have undoubtedly created new conditions for the pattern of life but the tribal practices and attitudes are almost unalterable in a short period of time. Both the bedouin practice and his attitudes are difficult to explain as determinants of the labour supply. Fortunately, the Plan for 1390 (1970) contains some relevant information which explains the actual labour pattern. In order, therefore to examine the attitudinal factors which influence the amount of labour available for work, it is far from

2. Kingdom of Saudi Arabia, Population Census for 1962 (Unpublished)

complete to consider either the projected labour supply and demand or to accept the discrepancy between them as an evidence of the actual labour behaviour. What is important in this connection is to examine the manner in which the bedouin chooses the job. For example, certain jobs are preferable to others; to dig a well is acceptable but to dig the drainage for a home is dirty and unacceptable.³ For example, the concentration of the bedouins in transportation services is an important indicator of attitudes to work. Some observers tend to link such development to the growth of income in transportation; this interpretation is reinforced by the number of workers engaged in transportation and services: 26% (Table 2.4.) This is an elementary factor because, if wage considerations are the determinant, plumbing and building should be among the first fields of work to attract the bedouins, which has not happened. These industries have attracted non-bedouins, in fact non-Saudis. Far more consideration is given to traditional values and the sort of work which does not separate the worker from his tribal contacts. Farmers who abandon their fields and work as drivers are motivated by these values.

Tribe is not only an important traditional institution but it also constitutes the social organisation. Moreover, Arabian psychology tends to resist any economic or social system which conflicts with traditional norms.⁴

3. Makki Al-Jamil, op. cit., p. 19.

4. Ahmed Al-Shaibany, The Arab Nationalism in Theory and Practice (Beirut Dar Al-Kitab Al-Araby, 1962), pp 141-185.

Some farmers, at Madina and Taif, told the present writer that they prefer to contract with non-Saudi workers due to the Saudi habit of resisting certain types of work or disappearing a few days after starting jobs.⁵

The drop-out rate of work among the Saudis is high, both in agriculture and the small handicraft industry, giving rise to a persistent impression among farmers and small business men that the bedouin are unreliable workers. This is why Yemenis, Jordanians and Egyptians appear more suited to the jobs which require sustained effort. The drop-out rate and refraining from certain types of work are expected to continue among the bedouin. Consequently, the demand for non-Saudis is undoubtedly going to grow for some decades to come. A solution to inducement of labour to agriculture lies in the organic nature of Arab tribal structure.

2.2.2. Arab Cultural Traits

Any work, as the bedouin see it, which isolates them from their tribal districts for some time is not sufficiently attractive. This is to say that attitudes, together with the tribal structure, seriously interfere with the bedouin's decision to work. As H.A.M. Muktar puts it: "The allegiance of the bedouin is first and foremost to his tribe and to its traditions."⁶

5. An interview with farmers who practise business beside their farming activities.

6. H.A.M. Muktar, Report to S.A. Government On Settlement Problems, 1971, p. 9.

Cultural temperaments are contributing a great deal to the labour shortage in agriculture and non-agriculture sectors, a fact that is constantly reported by the Central Planning Organization.⁷ This, of course, dictates a minimum level of investment and a new combination of capital and labour. Yet the problem is not only a quantitative issue, it is also a qualitative and a cultural one. An adaptation to the new conditions of work to the pattern of living is an obstacle to agricultural development, because the labour supply deficiency is expected to persist as long as labour attitudes to work remains unchanged. Several thousands of the bedouin tribesmen will be outside the pool of labour reserves which constitutes a national loss or what is usually termed labour waste. This is what makes the bedouin attitude a determining factor in agricultural transformation. The essential preconditions for agricultural development may lie in an effective persuasion to change or to modify their attitudes towards work. But this is a long term approach such as the hijra programmes initiated by King Abdul Aziz in the 1920's, where approximately sixty⁸ hijras were created in a relatively short time, or through educational diffusion. This does not mean that such policy measures are expected to create radical changes in the tribal structure, or to develop new attitudes which might be consistent with the new work requirements. It is acknowledged that modification of

7. Saudi Arabia, Economic Development Plan, 1970, pp. 75-81.

8. Amin Al-Raihani, Tareikh Najd wa Mulhaqatiha, wa Seerat Abdulaiz (Beirut: 1970), pp. 454-456.

the bedouin's attitude towards work involves a slow and complex process. Moreover the participation rate of the Saudi labour force depends heavily on the proportion of the bedouins who are willing, at least for a while, to ignore certain tribal values.

This problem, however, is difficult to resolve in the short-term. This is mainly because the desert acts as a store of the bedouin values, which has created a special pattern of life. Even in the major Arabian cities, one cannot fail to notice the inherent social organisation and the attitudes towards work which are deeply rooted in bedouin past culture. There are exceptional cases, however, where different cultural patterns dominate the major cities such as Makka and Madina; different attitudes towards work co-exist. But, despite his urbanisation, the bedouin tends to retain his special identity and insistently disregards any norm or value. which conflicts with his tribal tractions.⁹

The connection between the bedouin's attitudes and the nature of the desert is fairly clear. The bedouin is predominantly affected by his surroundings but he is even more highly influenced by his own history. That is to say that the bedouin values are entirely determined by his concept of the history of the Arabian desert. For example, they usually repeat the historical fact that the Prophet was a bedouin, and that other prophets were also bedouins. To them nomadic life is the best

9. Al-Jamīl, op. cit., pp. 13-17.

sort of life; from this pattern of "seeing things" we can easily appreciate what kind of values and virtues the bedouin associates with the nomadic life.

In the first place he considers the desert as a storage of his grandfather's values and norms, so his aspirations and his actual behaviour are governed by the way he visualizes the past. Furthermore, desert life does not only influence the bedouin's health but also conditions his way of thinking and his actions. Despite noticeable variations in bedouin characteristics they have a common one. They are exposed to the heat of the sun which causes their bodies to loose a great deal of water and salt. For this reason the bedouin appears relatively slim and thin, and it is possible that his slender appearance interferes with his capability to work and determines the pattern of his diet. More important, the bedouin tends to be extremely serious, occasionally nervous and highly sensitive. Yet, he keenly observes things and exhibits logical traits of observation and perception. His strength of memory is widely reported. But what is the relationship of all these characteristics to agricultural transformation and attitudes towards work? Needless to say both the bedouin's ability to apply oral instructions or to execute unwritten ones are severely handicapped by his illiteracy. Yet his ability to remember unwritten instructions, which is really a poor substitute for a literate farmer, is helpful. Finally, his love of democracy and his prominent sensitivity are vital issues

in farming business or in management and it underlies his behavioural attitude. This is to say that our understanding of the bedouin attitudes, not as we wish to see them but as they actually persist, might facilitate our endeavours to channel such attitudes into creative and genuine agricultural transformation.

The deep-seated attitudes towards manual work represent a constant constraint on agricultural transformation; modernization of farming is unlikely to develop without the bedouin's willingness to accept sedentary life, dirty hands and a minimum amount of surrender of certain tribal values.

Education is one basic tool which modifies attitudes towards work, but again this is a long-term process. Education has been expected to modify such attitudes, yet, at the present time, the growth of opportunities in the modern sectors has tended to foster those attitudes rather than to modify them. Even some trained agricultural scientists prefer the revolving chair instead of working in the fields. This is one reason among others behind the labour shortage in the country.

2.2. Structure of the Bedouin Economy

In dealing with labour problems and evolution of agricultural development one cannot afford to ignore leisure aspects and certain factors involving the transitional stage, because these elements underlie the

social fabric and economic organisation.

2.2.1. Leisure Aspects

Though domesticated animals are a source of wealth and enjoyment, hunting is a common practice. It is helpful in two ways; on the one hand it is an essential part of the bedouin economic welfare because game meat is a great contribution to living. On the other hand practicing hunting for its own sake is a leisure; it derives its importance not from its contribution to consumption and welfare, but from cultural considerations. The bedouin associates hunting with knighthood and warriors myths. Furthermore, it is not only a matter of individual satisfaction; a strong cultural bias gives hunting the form of tribal approval.

Unorganised hunting has dangerous implications, however, and involves two consequences, both of them bad. Firstly, there is constant destruction of the national wealth and extermination of the beautiful Arabian deer:ghazal. In an attempt to organise hunting practices, the government has promulgated special regulations and rules, including fines and certain penalties, yet these have been largely ignored. Secondly, hunting practices tend to reinforce attitudes towards work, since hunting can hardly be maintained in the cities which are remote hunting areas.

In the early stages of transition from purely bedouin life to sedentary activities, the blood ties

are strong enough to interfere with social mobility. The main reason is that the cultivation involves new patterns of work and new social organisation. In a recent study carried out by the Ministry of Agriculture in 1971, persistence of traditional values was noted:

The true bedouin nomads breed camels and for nine months in the year dwell in the desert places, far away from civilization and towns, where the best grazing areas are. These bedouins are entirely exclusive, and look upon themselves as the very salt of the earth, marrying only with exclusive tribes like their own and despising the rest of the world.¹⁰

2.2.2. Transitional Stage Problems

The first major change in the bedouin economy was successfully initiated by King Abdul-Aziz between 1920 and 1930. The political geography of Arabia was radically changed during this decade, the small emirates of Hijaz and Asir being transformed into the United Kingdom of Arabia. The hallmarks of such events were not a mere sedentary experiment of hijra or political strategy to put an end to the tribal conflict and disputes. The architecture of the hijra system undoubtedly implied political and social purposes against the existing pure tribal organisation at that time, yet the establishment of the hijra system went far beyond the limits of the bedouin state. It accelerated the process of a fundamental change in the structure of the bedouin economy. For instance, sixty hijras

10. H.A.M. Mukhtar, op. cit., p. 10.

were established in different parts of the country in two strategical ways. First, major tribes were chosen as a basis of sedentary policy; second, these chosen tribes were deliberately situated in carefully selected geographical areas. Now the bedouin attitudes both towards his government and work were gradually modified. His distrust of the government and a mutual distrust were substantially removed.

The natural bedouin does not know or practise the sedentary economy, but he is well aware that his traditional values and his ordinary business life are endangered by permanent settlement. The bedouin is voluntarily prepared to dig a well and does not mind dirtying his hands as long as the well is devoted to agriculture or drinking, but he is too dignified to dirty his hands in the construction and building industry or in digging a house foundation. Logically, to us, the nature of the work is the same, but to the bedouin it conveys different meanings. This is why the modification of the bedouin attitudes towards work dictate carefully long-term programmes.

Considerable efforts have been made to explain the nature of the bedouin economy and social structure.¹¹ As far as bedouin attitudes are concerned, the study by Burckhardt is outstanding. His success in this area stems from a combination of real understanding of the bedouin behaviour and clarity of thought.

11. Derek Hopwood, et al., The Arabian Peninsula Society and Politics, Bibliographical Survey (London: George Allen and Unwin Ltd. 1972), pp. 13-26.

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p 72

Moreover, the processes of transforming traditional agriculture in Western Saudi Arabia are affected by the labour attitudes which in turn depends on the traditional economic structure and the stages of social and economic development. Burckhardt estimates, which are presented in Table No.2.1, though old and not necessarily representing the actual economic conditions of the past Western Arabia bedouin, indicate the background of the transitional society against which the general feature of labour attitudes can be appraised.

In addition to the cultural traits, examined in section one of this chapter, distinction between bedouin property per se and the pattern of the general economic system in which he actually lives, may be made. The former sheds some light on the level of living standard whereas the latter illumines the determinants of individual attitudes.

Western Saudi Arabia is a transitional society by any standard. For this reason recent studies tend to stress the conclusion of the Dualistic Theory where the modern economic sector attracts more labour from the lagging or traditional sector, namely the agricultural sector.¹² This is true in many respects yet the linkage between the modern sector and the traditional sector is ignored without explanation. It is the purpose of the following pages to bridge this gap.

12. Benjamin Higgins, Economic Development, Problems and Policies (N.Y.: W.W. Norton & Co., 1950), pp. 314-331.

TABLE 2.1.

The Bedouin Budget

	<u>piasters</u>
Four camel loads of wheat	200
Barley for his mare	100
Clothing for his women and children	200
Luxuries, as coffee, Kammerdin*, debs, tobacco, and half a dozen lambs.	200
About 35 or 40 pounds sterling	700

* Kammerdin - dried apricot

Source: John Lewis Burckhart, Notes on the Bedouins
and Wahabys, (London; 1829), p. 20.

Table No. 2.1. may indicate the sort of economic conditions which dominated Western Saudi Arabia as well as the pattern of agriculture on which the living standard depended. Such agricultural conditions have, however, changed. First, hijra encouraged cultivation in the previously deserted areas such as Wadi Al-Hamdh. Second, the settlement processes have undoubtedly helped to direct more labour to cultivation and planting tree-palms as has occurred in Al-Molaileeh oasis which is one of hijra creation for the first time. Third, as a result, both economic structure and human resources have undergone considerable change not only in Western Saudi Arabia but also in the nation as a whole.

Traditional agricultural change in Western Saudi Arabia involves two fundamental changes:

At the micro level, the farmer and his family engaged in agriculture extend the area of their activities. For example, in Madina and Khayber craft industries flourish at the hands of women who produce mats, fans bags, cages and ropes from tree-palm. More participant labourers in harvesting and selling agricultural products tend to become permanently orientated to farming instead of engaged in seasonal work.

On the macro level, flows of labourers seeking jobs increase at the national level or at least in most of Western Saudi Arabia, a situation recently described as "regional mobility".¹³

These processes are not only changing the structure of traditional agriculture in the area of cultivation but also altering the nature of livestock production system. Pastoralism, livestock farming and household animal raising characterise livestock production at the present tim.¹⁴ Though these three types have not yet led to commercial production similar to that of Australia or New Zealand it signifies the gradual development in both production systems and overall transitional processes affecting the labour force. Furthermore, an overall tendency to increased numbers of livestock during the last twenty years, Table No. 2.2., implies that labour participation and the traditional economy have undergone considerable change.

13. Al-Farouk Sayyed Rajab, "Studies in the Geography of Saudis' Cities" Al-Khafjy 8 (1976), pp. 19-21.

14. Nasser O. Al-Saleh, Some Problems and Development Possibilities of the Livestock Sector in Saudi Arabia: A Case Study in Livestock Development in Arid Areas. (Unpublished Thesis, University of Durham, 1976), pp. 197-200.

TABLE No. 2.2.

Estimated Growth of Livestock
over Twenty Years, 1950/71

<u>Stock</u>	<u>1950*</u>	<u>1960/66**</u>	<u>1970/71***</u>
Cattle	60,000	1,350,000	1,505,000
Camels	265,000	3,000,000	3,455,000
Sheep	3,600,000	2,800,000	3, ,000
Goats	1,900,000	1,400,000	1,571,000

Source:

* International Bank for Reconstruction and Development,
Approach to the Economic Development of Saudi Arabia
(1960), p. 77.

** M.A.W. The Agricultural Census, Department of Research
and Development for 1960-1966.

*** M.A.W. The Agricultural Census for 1970/71.

2.3. Development of Exchange Economy

To appreciate how development of exchange economy has contributed to transformation of agriculture three factors should be taken into account: monetisation; changing pattern of production; and creation of administrative apparatus for money management.

2.3.1. Monetisation

Evolution of money in Western Saudi Arabia may be traced back to 1925 when King Abulaziz consolidated

the country and Hijaz became part of the kingdom. Two years later, 1927, the Riyal had been established as a national currency to replace Maria Theresa dollars; Indian rupees; British pounds and Dutch guilders. Circulation of such international currencies was intensively used in the main towns and particularly along the Red Sea coast during pilgrimage.¹⁵ Silver and gold coin circulation in the various Provinces of the Kingdom was undoubtedly facilitating agricultural products and exchange operations but quantities of money available for circulation were subject to severe cuts and interruption without warning. Fluctuations have to do with international conditions and the proximity of the various locations to the pilgrimage roads. Increasing world prices of silver and gold encouraged smugglers to move large amounts of these currencies across the Hijaz boundaries to Lebanon which became an international market for gold and silver. Subsequently these currencies disappeared from the national market at an alarming scale and flows of agricultural products among the Saudi Province were almost paralysed.¹⁶

These are the circumstances that led to issuing the present Saudi Riyal banknotes. This in turn faced the government with two main problems. One is the Islamic institutions' opposition to issuing banknotes

15. Thomas W. Shea, "The Riyal: A Miracle in Money", *Aramco World Magazine* (Jan-Feb. 1969), pp. 27-28.

16. Interview with The Agricultural Bank.

because this tends to violate the famous Islamic principle: "things exchanged must be of equal value."¹⁷ To satisfy this rule certain conditions should be fulfilled, i.e. metal money must contain actual values or having intrinsic value. Suspicious farmers bitterly resisted exchange of their products for banknotes, a situation that contributed to freezing land for a few years and affecting livestock prices and markets. Another problem was not only to convince public opinion regarding replacement of the old coins but to ensure that circulation of the new national currencies reached the various parts of Provinces and integrated national markets via one single currency.

2.3.2. Changing Patterns of Production

Traditional activities of most of the Saudi Arabian population are a pastoral and agricultural economy. Yet such major activities are gradually changing in composition and distribution. The first estimate survey showed that field crops constitute 75% while vegetables, dates and fruits represent 12.4% and 12.6% respectively. Table 2.3., despite an absence of systematic data to indicate the trends of agricultural production these percentages suggest the way in which production responds to money and economic forces, i.e., fields crops seem attractive to money flows. Furthermore, impact of money on pattern of production depends

17. Thomas Shea, op. cit.

on variations in population and their relative concentration. As Table 2.3. shows, 67% of the cropped areas lie in the South and Central parts of the country where the population is concentrated.

Least populated areas such as the North have less share of cropped areas than the rest of the Kingdom. Yet the main contribution of the North lies in the production of livestock. It is only in recent years that its position as the main producing areas of animal wealth have undergone change. The national policy is indeed affecting allocation of agricultural resources by injecting more money in the rural economy and enhancing the processes of market integration.

The impact of the whole process on labour is fairly obvious, for deliberate modification of patterns of production by the manipulation of money, involves shifting agricultural activities not only in the patterns of production but also in sorts of labour associated with such activities. An unpublished report produced by a consultant concluded that 66% of the population are engaged in agriculture.¹⁸ Only a few years later the First Plan estimated the percentage had dropped to 46.2%.¹⁹

18. Report to Saudi Arabia Government, 1965.

19. Saudi Arabia, First Plan op. cit., p. 77.

2.3.3. Creation of Administrative Apparatus

As already mentioned introduction of organised money requires establishment of a national institution able to diffuse the right money at the right time into the national economy, i.e., proper methods of money manipulation. Thus the Saudi Arabian Monetary Agency (SAMA) was established in October 1952 for such a purpose. But as an Islamic country, Saudi Arabia dare not establish a bank whose survival depends on engaging in interest or charging on money lending. Moreover, neither the word "bank" nor the banks activities could be easily introduced without provoking hostility. So "agency" seems acceptable at least at the beginning until the people get used to a banking system and the circumstances involved in monetisation developments.

At the present time branches of SAMA and growth of national and international banks are active in money operations not only in the main towns but also in the relatively big villages. It is these developments which gave rise to the recent spread of wage phenomenon and might have orientated traditional agriculture toward commercialised agriculture, because the more the money supply the less constraints on labourers who are willing to work.

The banking system following the creation of SAMA is undoubtedly helping both resource allocation and wage initiation since record of money supply is increasing as follows: an increase of 21.7% in 1970

TABLE No. 2.3.
Annual Cropped Area by
Type of Crop and by Province
1960 - 1963

(Area in Hectares)

Province	Field Crops	Vegetables	Dates & Fruit	Total	% of Total
North	8038	778	2320	11136	4.2
East	2368	899	11000	14267	5.3
West	17005	4008	4711	25724	9.6
Qassim	26486	8190	2648	37324	13.9
Central	42930	14165	5304	62399	23.3
South (Estimate)	104188	5092	7785	117065	43.7
TOTAL	201015	33132	33786	267915	100.0
PER CENT OF TOTAL	70	12.6			

Source: Edmond Asfour, Long-Term Projection of Supply and Demand for Agricultural Production in Saudi Arabia (Beirut: Economic Research Institute, American University of Beirut, 1965), p. 62.

from the previous years to 25.9% in 1972,²⁰ which was only 8% in 1968. Furthermore, money supply has jumped from slightly less than 1600 million Riyals in 1965 to 3200 million Riyals in 1972,²¹ which has doubled within seven years.

What these trends suggest is that both economy and agriculture are becoming rapidly monetised, making the evolution of commercial agriculture and the introduction of wages major forces in transforming traditional agriculture.

2.3.4. Operation of the Bedouin Economic System

The process of agricultural transformation, in any dynamic sense, cannot be fully understood without detailed analysis of the origin of the labour supply, present features and future prospects. The reason for this approach is dictated by the fact that, as the human resources of the transitional societies moved from one era to another, the totality of the social organisation, and the pattern of the economic structure, tended to retain many of its social habits, values and norms. By stressing the labour attitudes towards work we endeavoured to explain the main labour traits inherited in a transitional society. Indeed, establishing a linkage appeared as a determining factor of labour supply and economic structure. To show the extent of such linkage it is imperative to investigate the

20. Saudi Arabia, SAMA, 1972, op. cit., pp. 21-24.

21. Saudi Arabia, SAMA, 1968, op. cit., pp. 18-19.

actual labour distribution.

First, Table 2.4 shows that 46.2% of the labour force is engaged in agriculture. It is probable that more than 60% of the labour is engaged in agriculture, but, due to oil injection in the traditional economy, this percentage is declining.

Secondly, approximately one third (31.3%) of the labour is concentrated in the Commercial (9.5%) and Service Sectors (21.8%). Rightly, the literature on Saudi Arabian problems has related such phenomena to the oil revenues. Yet, this literature has continued to underestimate the motivations behind labour shift to certain types of work. Indeed, introduction of the oil industry created unusual opportunities for jobs and several thousand bedouins moved from the surrounding desert to the towns and cities. (Table 2.5.). Consequently, the initiation of the linkage was established by the means of money (feed back) and the labour activities. What happened is that the scale of activities spread in various spheres of the economy. The linkage opportunities took the form of commercial activities and self-employment. As already shown, 9.5% of the labour force engaged in commerce.

Third, the distribution of labour force among the economic sectors showed that 10.3% has been absorbed by the Construction Sector. In fact this represents a direct linkage operation because such activities have succeeded in bringing relatively stagnant economic

TABLE No. 2.4.

Distribution of Labour Force by Economic Activity and Region, 1966

(in thousands of workers)

Type of Activity	Region					per cent of total	
	Central	East	West	North	South		Total
Agriculture, fishing, livestock and bedouins	83.3	33.8	78.2	55.5	213.9	464.7	46.2
Mining & Quarrying	0.3	23.9	0.2	0.3	0.5	25.2	2.5
Manufacturing	7.2	7.3	18.7	1.0	6.8	41.0	4.1
Construction	32.1	11.2	46.5	3.5	10.8	104.1	10.3
Electricity, gas, water	0.9	1.4	3.4	0.2	2.6	8.5	0.8
Commerce	18.3	10.7	41.4	5.5	19.9	95.8	9.5
Transportation, communication & storage	10.5	7.8	18.4	1.6	5.6	43.9	4.4
Services	60.7	24.9	87.9	18.4	27.0	218.9	21.8
Activity not defined	2.2	0.8	1.0	-	0.5	4.5	0.4
TOTAL	215.5	121.8	295.7	86.0	287.6	1,006.6	100.0

Source: Central Department of Statistics: Demography Survey, 1965-66, p. 43.

units within the newly growing economy. More important transportation and communications within various national provinces made the linkage operation possible (Fig. 1.5.).

Now, the traditional sector is declining and as we tried to show the traditional economy as a whole is gradually weakening by the linkage operations. Yet, the rate of the transformation of the traditional sector into the modern sector tends to be delayed by labour attitudes. For the oil industry and the linkage operation can be interpreted as an engine of agricultural transformation and could be a potential trap for agricultural development. The previously explained problem of labour attitudes and the sectoral labour allocation have already shed light on the nature of the human resources.

An assessment of the labour supply in agriculture should be based on adequate data. Unfortunately the trends of the labour distribution among the economic sectors are not sufficiently well-known for at least two reasons. Uncertainty of data is a basic problem. More important, an adequate reassessment of the labour supply must be based on sectoral disaggregation, which is not available. In spite of these problems indirect evidence of an acute labour shortage has been confirmed by the Central Planning Organisation (1970). On one hand the distribution of the labour (Fig.2.4) suggests that the process of diverting human resources from a traditional activity to modern economy has been largely influenced by individual attitudes; on the other hand

TABLE No. 2.5.

Employment in the Oil Sector, 1963-72

(number of workers)

Employment	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972
Aramco	12,988	12,880	12,783	12,664	12,073	11,531	10,865	9,782	10,139	10,362
Petromin	65	101	144	424	746	1,285	1,608	1,660	2,049	2,158
Arab Oil Co.	745	903	928	1,027	1,092	1,165	1,244	1,241	1,326	1,345
J. Oil Co.	894	988	963	953	945	935	924	920	859	829
	—	—	—	—	—	—	—	—	—	—
TOTAL	14,692	14,872	14,818	15,068	14,856	14,916	14,641	13,603	14,373	14,694

Source: Ministry of Petroleum and Mineral Resources.

the rapid rise in income of certain sectors has contributed to a strong incentive to leave agriculture.

The foregoing argument is not only intended to explain the nature of the labour supply, but also aimed at the question of policy strategy. One conclusion could be derived is that no direct action can be anticipated to mitigate the inbuilt cultural bias, but surely indirect action will produce favourable results. Education is one area where such action is viable.

2.4. Types of the Bedouin Migration

Bedouin migrations in Western Saudi Arabia can be classified under five categories: tribal migration; the "natural bedouin"; sheep and goat bedouin; self-sufficient villages, and finally the transitional migration type. Moreover, each type suggests what sort of labour operates in traditional agriculture and may indicate the way in which the quality of labour affects the processes of transformation.

2.4.1. Tribal Migration

One of the basic characteristics of this mode of life is a conspicuous waste of human resources. This is particularly true when a sedentary period is limited to the time of harvesting, after which agricultural activities cease to exist. This is a classical feature in the small oases such as Khayber and Al-Mulaileeh, where irregularity of agriculture and tribal migration

tend to persist. Consequently human waste, i.e. unemployment, dominated traditional agriculture until the hijra and oil development.

Moreover, the coincidence of this type of tribal migration with a passive Turkish regime did great damage to traditional agriculture which was once prosperous and relatively efficient. To quote Walpole: "...gardens and irrigation ditches throughout the country and ruins of ancient dams in Taif and Khayber give evidence of a rather prosperous agriculture in time past".²² Continuation of tribal roving between the grazing areas and the villages was fostered by a deliberate Turkish policy. That policy made some major tribes and the sedentary populations of Makka and Madina virtually dependent on annual charity from Egypt and Palestine i.e. the tribal leaders and dwellers were granted salaries and specific amounts of grain and other agricultural products. Refaat Pasha listed fourteen major tribal leaders, along the road between Madina and Yunbu (approx. 140 Km) who received an annual allowance from the Turkish government in order to maintain roads safety and village security.²³

These socio-economic conditions acted as a constant deterrant to agricultural development and interrupted the continuity of migration flows to villages

22. Norman C. Walpole, et. al., Area Handbook for Saudi Arabia, (Washington, D.C. 20402: U.S. Government Printing Office, 1966), p. 213.

23. Ibraheem Refaat Pasha, Miraat Al-Haramain, Al-Rehlat Al-Hijaziyyah, Vol. 2. (Cairo: Dar Al-Kutub), p. 42.

and towns. Under such circumstances the agrarian system of bedouinisation²⁴ persisted, producing a kind of mentality which hardly serves as a foundation for modern agricultural development, but enhances various types of tribal movements, i.e. the natural bedouin; sheep and goat bedouins, and bedouin who settled in the villages yet retained some aspects of migrating bedouin life.

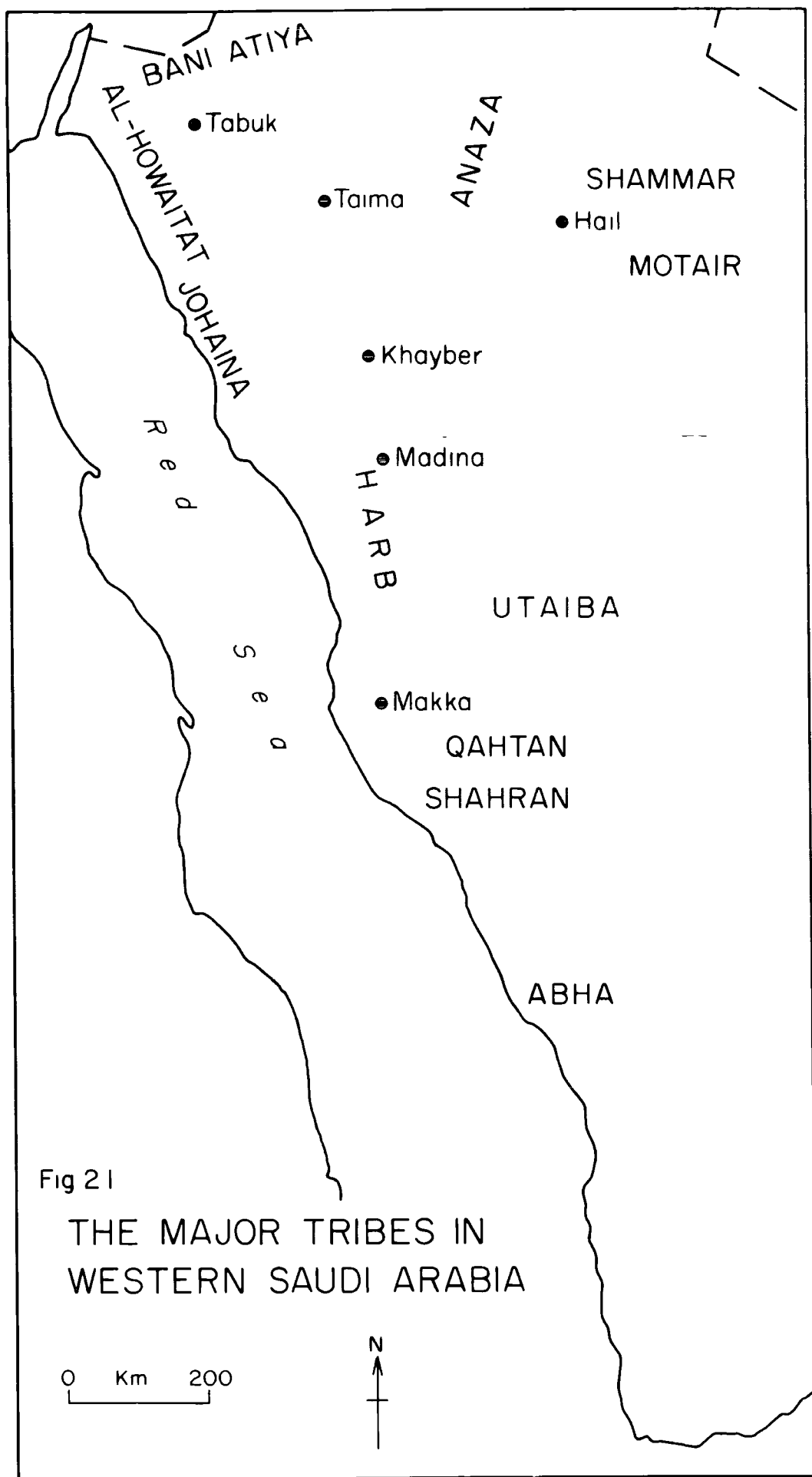
Degrees of nomadism are difficult to distinguish, however, tribal migration type consists of three main categories according to the frequencies of bedouin movements and the geographical distances associated with them as follows:

2.4.2. The "Natural Bedouin"²⁵

The purity of the bedouin life and its relevance to labour migration is obvious. For one thing the movements' frequency of the famous tribes of Western Saudi Arabia, namely Shammar, Anaza, Johaina and Harb Fig. 21 are typical bedouin recurrent activity. Roaming the vast deserts tends to make the chances of settlement as remote as the past time which produced such life e.g. the reluctance of Anaza and Howaitats to migrate is not hard to explain. First, they enjoy a relatively fertile land (in the Northern Hijaz). Second, their stock are mostly camels. These two factors enhanced

24. The Cambridge History of Islam, Vol. 2. "The Geographical Setting" by X. De Planhol, pp. 447-50.

25. A. Ibn Khaldoun, The Prolegomena, (Baghdad: Maktabat Al-Mothanna, n.d.), pp. 120-130.



their extreme attachment to their tribal-districts and made the process of adaptation permanent settlement special in various ways. Their extreme attachment to the Arabian desert is a major obstacle standing in the way of a large-scale migration. Thirdly, this pattern of wealth tends to perpetuate tribal movements within traditionally recognised districts in northern Hijaz. For one thing the camel is not only capable of crossing relatively long distances but also possesses a symbolic value or social prestige. Even when the camel's function as a means of transportation has been substituted by a car, the bedouin's love of the camel for its own sake is hardly diminished. Thus, it is the intrinsic value of camels which tends to outweigh any monetary value, i.e., price in Saudi Riyal, and which tends to perpetuate tribal migration.

Traditional agriculture exists beside camel breeding and rearing in most of the Hijaz areas yet the level of agrarian techniques is certainly not advanced. "Nomadic societies in the Middle East do not exist in isolated habitats. They are usually in contact with other nomads, with villages, markets and towns. Furthermore, the data clearly indicate (contrary to idealised views of nomadic peoples) that many nomads raise cereal crops, and are sometimes engaged in complex and demanding forms of cultivation and marketing."²⁶

26. Cynthia Nelson, ed. The Desert and the Town, Nomads in the Wider Society (California: Institute of International Studies, 1973), p. 23.

So in one way the camel tends to facilitate bedouin movements and contact with the outside world and in another it makes bedouin mobility over vast desert possible for better water and grazing areas at certain times. It is these ranges of movements which have made the bedouin consciousness of his world seem practically possible.

2.4.3. Sheep and Goat Bedouin

This segment of the Saudi Arabian population possesses 80% of the national wealth of livestock: sheep and goats.²⁷

Sheep are a valuable source of milk, meat, cheese, butter and dried milk. Goats provide milk and from their hair tents and rugs are made. Needless to say, traditional sheep and goat leather industries have served multiple purposes such as shoes, bags, water skin and have absorbed many workers. The leather industry has been extended to towns of Makka and Madina and continues until the present time, although it is declining rapidly due to importation of cheap foreign products.

The movements of this type tend to be frequent but short in range. The main reason lies in the economic relations between the villages and the surrounding areas, because the bedouins as suppliers of meat and traditional dairy products: cheese and butter are enforced by a poor transportation system to keep close to new marketing areas.

27. Infra, Table 32.

Contiguity of these tribes to roads connecting Makka and Madina enabled them to get a taste of sedentary life. The way of life of the bedouin in close proximity to the main villages at the present time resembles the urban ways of living. For example, food intakes are almost the same, even in different parts of the country. The intake is called wajbah which is three times a day: the breakfast is arrayuq in Najd and fakuk arreeq in Hijaz, while dinner is called ghada in the entire country. Supper is normally taken early in the night.

The situation in the pure bedouin type is slightly different. The breakfast is called sabuh, which in original Arabic, means "milk for breakfast". Only coffee and dates usually accompany sabuh and ghada (the dinner) whereas other intakes are governed by food availability and seasons. The implications of such feeding habits signify ongoing cultural and traditional characteristics of Saudi Arabian society. Moreover, uncritical notions which implies separate social patterns for bedouin and sedentary people should be abandoned. For if separate social units prevail in the country both migration flows and settlement programmes would be affected in reverse fashion.

To appreciate the processes of settlements which produced the present labour force one should take into account the socio-economic factors underlying the structure of the social fabric. One way to do so is to consult the available population census. The first census appeared in 1931 which showed that 60% (3 mn)

were bedouins while 4% (2.2 mn) were hadur i.e. sedentary population.²⁸ This estimate is consistent with IBRD which maintained that "more than half of the population are nomadic or semi-nomadic bedouin. Probably one-fourth reside in the principal population centers around the capital, Riyadh, the Red Sea port of Jeddah, the Holy places at Makka and Madina. "²⁹ A great deal of change has, however, occurred in recent years. One aspect of such change is that 79.2% of the Population are settled whereas only 20.8% are nomads.³⁰

Although reservations should be kept in mind regarding statistical reliability, migration to towns and villages is altering patterns of population, i.e. settled and nomads, and fostering new integration processes. Donald, P. Cole suggests that bedouin intergration into urban society occurred on three levels:"

"At the first level the focus is on the ways in which villages fit into the ecology of pastoral nomadism; a lineage-type structure is the unit of social organisation most operative on this level. At the second level the focus is on the ways in which a tribe, taken as a unit in itself, is tied to a regional urban center which is the focus of many activities necessary to the life of the nomad, as well as the major field of activity of successful tribal leaders. At the third level the focus is on the way in which tribes taken together as a single catagory in Saudi Arabian society..."³¹

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28. Fuad Hamza, Qalb Jazeerat Al-Arab (n.p. Mohib Al-Deen Al-Khateeb, 1933), p. 78.
 29. IBRD, Approach to the Economic Development of Saudi Arabia, (Nov. 1, 1960), p. 1.
 30. Saudi Arabia, Population Census for 1962/63, (Unpublished).
 31. Cynthia Nelson, op. cit. p. 114.

The pattern of the bedouin emerging from this analysis may suggest the ways in which adjustment processes have developed.

2.4.4. Self-Sufficient Villages

The phenomenon of self-sufficient villages not only represents one degree of Arabian pastoral economy where goats and camel are combined, but marks a phase in the transformation of agriculture. Growth of villages, reported to be 6113 (old and new), signifies a prolonged process of declining bedouin population where almost 80% of the total population is reported to be settled.³²

Undoubtedly the oil industry has accelerated the process further, yet the structure of the bedouin economy still retains its general features. Self-sufficient villages are one form of such features, whereas the type of labour operating traditional agricultural activities is one consequence of the migration waves of surrounding bedouins. This labour force is both a foundation and source for future developments.

Khayber, Al-Jafor and Al-Ula, to mention a few, are examples of self-sufficient villages where voluntary migration to towns and abandonment of nomadic life has tended to shift traditional activities from desert and sown to permanent cultivation.

32. Unpublished population Census for 1962/63, op. cit.

The villages and the newly-developed areas in the proximity of Madina have not only altered the traditional position of self-sufficient villages but have also created a circular migration unknown before in the history of Western Saudi Arabia. The newly developed areas along the Hijaz - Damascus stations tend to encourage such circular flows of labourers because the bedouins who used to live there, enjoying existing water and grazing areas, founded the practices of permanent cultivation in their old areas, imply their attachment to their old districts as well as staying in towns.

2.4.5. Transitional Migration

Development of self-sufficient villages has been followed by what can be termed transitional migration. This is particularly true in Jeddah and Madina where sudden population growth has dominated both towns, (Table No. 1.3.). The transitional migration phenomenon not only signifies an end of tribal migration but also marks a new stage of agricultural development.

2.5. Traditional Agricultural Change

Causes of declining traditional agriculture lie in the increasing capacity of towns and villages to absorb more labour and more agricultural products. Increasing population pressure gives rise to acquisition of improved agricultural techniques, at least in the major towns such as Makka and Madina.

Malthus maintained that population growth is rapid and tends to increase in geometrical ratio, while food supply tends to increase relatively slow and takes place at an arithmetic ratio.³³ Neither Western Saudi Arabia agricultural experience nor the recent study by Ester Boserup support the Malthusian perspective.³⁴ On the one hand, the processes of agricultural development associated with hijra have been accompanied by urban growth and, on the other hand, socio-economic variables subsequent to urban development are certainly affecting social organisation, as implied throughout this thesis. The process of improving agricultural techniques can best be appreciated as a dynamic response to environmental problems and human resources. For exerting population pressure on land tends to encourage better land utilisation and may raise the efficiency of labour through adaptation to regular work.³⁵ The whole relationship suggests that agricultural development involves a long-term process or "historical sequence" as Boserup put it.³⁶

Moreover, whether examination of such an historical sequence is based on a few centuries or decades, her argument seems to hold good either way, not only because it is consistent with Western Saudi Arabia's experience but also because it is compatible

33. Thomas Robert Malthus, Essay on the Principle of Population (London: T. Bensley 1798), pp. 20-22.

34. Ester Boserup, The Conditions of Agricultural Growth, The Economics of Agrarian Change under Population Pressure (London: George Allen & Unwin Ltd. 1965), pp. 11-14.

35. Boserup, ibid. p. 75.

36. Boserup, ibid. pp. 16-18.

with the early Arab agricultural development which is confirmed also by A.M. Watson,³⁷

Viewed in the spirit of this historical sequence, both transitional migration type and agricultural development involve a combination of improving living standards and educational development.

2.5.1. Improving Living Standards

As the foregoing discussion has attempted to show, failure of tribal migration to induce effective agricultural change stems from the way in which circumstances tend to strengthen the fundamental opposition between the majority of the population, predominantly bedouin, and the small or limited population in the towns. In the proximity of the towns the cultivated areas and living standards improved, and eventually growth of demand for agricultural products increased.

The development of a new urban model created by both hijra and oil influenced levels of income and attitudes of people who are hostile to town and who evade permanent settlement. Despite the paucity of statistics and lack of adequate information, improving living standards is self-suggestive. Moreover, 84000 persons surveyed between 1962 and 1968 showed that 14% of them derive their income from more than one wage earner, which of course means that 86% derive

37. Andrew M. Watson, "The Arab Agricultural Revolution and its Diffusion, 700-1100", The Journal of Economic History 34 (1974), pp. 8-34.

their income from employment depending on one employed person.³⁸ Aramco, which conducted this survey for its employees, only showed that changing family consumption in this segment of population is highly consistent with the general trends, e.g. food category expenditures on fruits and vegetables rose by 20% while grains and bakery products increased by 13%. This is not to say that source of income and type of consumption represent a radical break with the past; on the contrary, improving economic conditions results in negligible cultural change since those who are experienced in these trades are either adult who have already finished their education or else children in the primary school. Nevertheless, everyone who has had school education is a part of the stream of immigrants into the cities and enjoys a relatively improved standard of living.

One way to estimate improved standards is to resort to the caloric intake which shows that diet of the Saudi population has undergone fundamental improvement during the last decades. It has almost doubled within eleven years, i.e. per capita intake jumped from 1432 to 2387.

2.5.2. Effects of Education

The contribution of education to transforming traditional agriculture is complex and difficult to appraise, however, one might appreciate such contribution by going back to the early stage of the

38. Thomas W. Shea, "Measuring the Changing Income Family Consumption Patterns of Aramco's Saudi Arabia Employees 1962 and 1968", Aramco, 1962, pp. 23-30.

country when illiteracy dominated Saudi society. Under those circumstances one would hardly be able to find competent farmers or experienced middlemen who could provide the essential services in the cities or villages.

It is true that the supply of agricultural skilled persons is not growing enough to meet the country's needs and it is true that there is only one agricultural college, yet an indirect impact of education on agriculture is already felt in that the growth of schools in the cities is due for the most part to migration from tribes previously living in remote areas. Furthermore, the attainment of a certain educational level has usually been followed by better economic conditions which in turn tend to generate a new demand for agricultural products. Indeed this is what happened in the Western region when a demand for Madina dates shifted in favour of vegetables and fruits. For this reason tree-palm, which constitutes a major part of traditional agriculture, is one victim of such a structural transformation

Declining traditional agriculture in Taif, Wadi Al-Safra and Al-Figra have increased the population drift to major towns in the Hijaz and greatly weakened the main structure of traditional agriculture. In consequence this declining sector has created a large proportion of unemployed labourers in the cities. These labourers are merely half-educated and their opportunities to find jobs in the cities have already decreased through the very fact that the Saudi economy is growing and their

educational level is not of a sufficiently high standard for jobs in the modern sector. This fact has discouraged large migration drift up to the 1960's because the capacity of the modern sector to absorb labour reached its limit as Table No. 2,5. reveals.

In brief, two factors militated against traditional agriculture, i.e. gradually improving agricultural techniques and a diminishing population in the remote areas. Even resumption of agriculture in old places such as Al-Jafor and the villages in the proximity of Madina does not represent a retreat to the old methods of cultivation. The general trends reflect a revival of most "dead" (un-used) land, yet the areas which the author has surveyed could be grouped under three classes.

2.5.3. Effects of Rehabilitation

Ancient land of Al-Zobair has been developed by relatively new methods of irrigation and cultivation, i.e. instead of qunayat or horizontal wells pump-engines have been introduced. Other old plots in Madina which have been deserted since the Turkish regime brought them back into active cultivation. Without these two developments Madina would have become an urbanised oasis without agriculture because the expansion of the city itself has already swallowed up most of the best cultivable land.³⁹

39. Interview with the officials of Agricultural Bank in Madina.

2.5.4. Innovation

Farmers whose land is under active cultivation have found it very difficult to compete with new farms without modernising their own which are made up mostly of small plots and cannot adopt improved techniques. Improvements in this area included use of fertilizers, irrigation, and replacing old transportation methods by new ones. Disappearance of carts drawn by animals is an example where the motor car represents the principal means of transportation in most of Western Saudi Arabia. Other examples of renovation development are repairs to some deserted wells and the annexation of land, whose owners are not known.

2.5.5. Revival Development

This type of land has been already mentioned in the previous chapter and in fact both rehabilitation and renovation are two forms of the new development. More important, the farmers who took the initiative in this field are educated (primary school) and few are uneducated farmers.

One problem of transitional migration is the phenomenon of absentee farmers i.e. landlords: a situation previously unknown in the history of agriculture in Saudi Arabia. Landlords tend to hire Yemenis on a casual basis, creating an agricultural wage differential depending on location of the fields. This is a semi-commercial agriculture in small holdings whose owners are engaged in other economic activities.

Thus the implication of transitiioanal migration is an obvious structural transformation on the human side in the form of declining traditional agriculture, as has happened in Western Saudi Arabia.

2.6. The Labour Market

The development of the labour market in Western Saudi Arabia is reinforced by the source from which the labour originates and the growth of specialisation within and outside agriculture as the following discussion will reveal.

2.6.1. Sources and Origin of Labour

Beside the two events: hijra and oil discovery, which sparked off great waves of migration, four sources of migration flows may be identified, under four headings: drought; seasonal migration; internal migration; and immigrants from neighbouring Arab counties.

2.6.2. Drought due to Migration

Most of the H1jaz tribes tend to hold strong attachment to their tribal districts yet natural vagaries have, in recent years, strongly weakened the traditional affection for their land. Flood and drought have inflicted enormous loss and subsequently enforced them to migrate to the main cities: factors which gave rise to most of the Harb, Johaina, and Al-Howaitat migration. The number of there tribes is diminishing because

successive unpredictable droughts and occasional floods wipe out their animals. Involuntary sedentary life and cultivation become the only alternative. They joined the national labour force under the pressure of the physical conditions.

2.6.3. Seasonal Migration

Another important labour source is the seasonal migration especially in Khayber and Madina where harvesting lasts only a few weeks. Increased wages and improved transportation facilities are contributing factors in this regard. It is a short-lived phenomenon but it is a temporary relief and enforces the contact with the towns and cities.

Flows of migration between cases and labour districts is similar to seasonal migration because both situations represent a non-permanent labour source and both are influenced by locational proximity. Yet most labourers who migrate from villages and neighbouring tribal districts are vital to the main oases, especially Madina and Makka.

2.6.4. Immigrants from other Arab Countries

The three previous sources of migration are insufficient to meet the increasing demand for labour. Recent reports revealed that despite flows of labourers to the major towns there are both qualitative and quantitative problems: approximately a 1.5 million shortage as required by an overall economy and in-

sufficient skilled and semi-skilled labourers.⁴⁰ Yemenis accept low wages and are prepared to work in various sorts of employment hardly acceptable to the average Saudi worker due to the influence of cultural bias. Such factors gave rise to Yemenis' domination of agricultural fields and virtually all sorts of jobs in Western Saudi Arabia. Improving economic conditions, in their country reversed the situation drastically, however, and caused severe labour shortage in agricultural fields and non-agricultural works.

2.6.5. Prospects for Specialisation

The development of occupational specialisation in the Western region has created new trends in the labour market. Establishment of asphalt roads turned the huge Saudi Arabia area into a shrinkable world. Long distance transportation made geographical distribution of labour among the oases possible and supplied the modern economic sectors with redundant labourers from various locations. Generous wages are confined to specific kinds of work. In this regard, specialisation may be divided into two main groups, agricultural specialisation and specialisation in the rest of the economy. Though specialised farming systems are not yet fully developed there are signs of gradual departure from the traditional farming practices. The farmers who are engaged in the cultivation of palm-trees and vines are trying to shift to alfalfa or vegetable cultivation but, due to the old irrigation methods, the transformation is difficult to achieve. Yet despite such difficulty the old traditional

40. Government of Saudi Arabia, Economic Development Plan, (1970), p. 110.

farming systems are declining in most of Western Saudi Arabia. The present author noticed that many newly developed farms in Wadi Fatema, Madina, are specialised in one or two particular agricultural activities. Moreover, some businessmen and small companies are developing new specialised farms in Wadi-Alsafra on the remains of qunayat (qanats). Prospect for specialisation depends on two main issues, i.e., availability of water and specialised labourers.

CHAPTER THREE

The Role of Capital in Transformation
of Traditional Agriculture

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Introduction

This Chapter is divided into three sections :

Section one examines traditional capital.

Section two reviews sources of capital within
traditional agriculture.

Section three examines government participation
in the capital market.

3. Traditional Capital

In this study the term capital is used to include any inputs that increase the productive capacity of agriculture in Western Saudi Arabia. The main stress is on the range of inputs which are expected to generate income as it actually operates within the traditional community under the present study. Another important distinction has been made, i.e. between circulating capital such as the eggs put aside for hatching; wheat for sowing and fix capital which includes tree-palm and wells.

3.1. Use and Abuse of Capital

In Western Saudi Arabia, the term "capital" does not exist in the sense that it originally developed and is used in the capitalist or industrialist nations, where emphasis is placed on the processes of capital accumulation. As William J. Baumol maintains; "capital, in sum, is any previously produced input or asset of a firm or any other producer."¹ However, it did exist with a different meaning and under different circumstances, and fulfilled similar functions in agricultural activities. But why is there no systematic treatment of capital in Saudi Arabian literature?. The reason for the infrequent use of such a

1. William J. Baumol, Economic Theory and Operations Analysis, (New Jersey: Prentice-Hall Inc. 1972), p.432

term in Saudi Arabian literature may be stated in a few words: the term 'capital' is not free from either abuse or confusion. More important, the emergence of huge oil revenues in Saudi Arabia diverted the scholar's attention to the modern sectors, without giving due weight to the evolution of capital in traditional sectors. It is the purpose of this chapter to put capital in proper perspective. The task is therefore to differentiate between capital as an instrumental concept, and capital as an agent of production. If we use the term correctly, we will be in a position to analyse agricultural transformation more adequately than we otherwise might. In the analysis which follows, there is no substantial deviation from the contemporary meaning of the term. It is necessary, however, to go beyond the rigidity of the literary meaning to a meaning more flexible in the breadth of its applicability as the special circumstances of the Saudi farmers dictate. The successful experiences of industrial nations such as U.S.A. and Canada have deceptively inspired most scholars to conclude that since the agricultural sector tends to absorb comparatively few labourers then any successful agriculture must follow a similar pattern to theirs. An increase in agricultural production can occur, they maintain, only with a decrease in the rural population density and with the introduction of new technology. Moreover, supporters of this view argue that increasing productivity implies radical

decline in farm population (as a percentage of the total population). Such an argument stresses the fact that from 1920 to 1963 the farm population in U.S.A. dropped from 30.1 per cent to 7.1 per cent. In practice this means a real cut in agricultural employment. Any argument along this line of thinking is straightforward and conceptually correct, yet its application to a transitional society such as Western Saudi Arabia does not seem appropriate, and can even be dangerous if applied to agricultural policy. The main shortcoming of such an argument is in its over-emphasis on capital as a substitute for labour.

Considered in this light, capital is assumed to be previously created, accumulated and fully developed. This is an unrealistic assumption because the question of how the farmers had accumulated capital in the context of their wealth is hardly raised. There is, however, one serious attempt in this connection that has been made by Burckhardt. He did not exploit this point as fully as he might have done however; instead he confined himself to economic stratification within a tribal economy.² It seems appropriate to comment briefly on the meaning of capital in this connection. In the first place Burckhardt is one of the writers who are not interested in an explanation of

2. Burckhardt, Notes on the Bedouins and Wahabys, p.20

capital formation. Their studies were more narrowly directed to economic stratification. For instance, if a bedouin owned only ten camels Burckhardt described him as poor, but if he owned sixty camels or more he was considered rich. At the present time, some sheikhs of Anaza are thought to possess three hundred camels or more and must therefore be considered very wealthy.

This type of approach has undoubtedly enriched our knowledge regarding the form of the wealth but it overlooks or ignores concepts of capital creation. Such an ideological concept does not seem compatible with an explanation of the processes of capital formation. The other side of this approach stresses the patterns of consumption and diet as factors influencing capital formation.

Indeed, capital formation has been correctly regarded as a critical problem for economic and social development in general, and agricultural transformation in particular. These capital theories have been developed on an international level. They are derived from the experiences of the Industrial Revolution. The aspirations and endeavours of social scientists to develop a universal theory have not been as successful as intended. In the first place, changing international structures have created different phases of social development under various

physical conditions. In the second place, the growth of conflicting ideologies has contributed both to distortion and abuse of the term 'capital'. Thus, the term and its related concepts are inconsistent with experience of agricultural development in Western Saudi Arabia and are theoretically misleading.

Distortion and abuse of the term are readily observable in the literature of traditional agriculture in Western Saudi Arabia. For example, those who lean towards socialist concepts tend to ignore the relevant elements of agricultural development and instead emphasise the legal side. For this reason the tribal economy has been narrowly visualized from this angle only.³ Of course any writer is free to choose his own approach and to define capital in his own way. Conclusions that might emerge are nevertheless subject to considerable doubts and dangerous when applied to agricultural policy. The dangers of the analysis lie in the fact that once ideology colours this term it takes on another meaning and subsequently leads to different conclusions. If one takes livestock as a form of capital the question must be posed: to what extent does socialist-type literature explain its growth and development? We can hardly find an adequate treatment because such a

3. Charles Issawi, The Economic History of the Middle East A Book of Reading, (The University of Chicago Press, 1966) p. 342.

classical approach is mainly concerned with this form of wealth from the point of view of social stratification and wealth distribution. Writers start by describing and analysing Arabian physical and social conditions and end with typical conclusions that tribal sheikhs are a prominent class and classify the rest of the bedouins in a lower class according to the level of the wealth. This classification is also extended to the commercial markets such as "market class" and "merchant capitalist" and so on, as Rodinson implied in his book⁴. The present author's objection to such usage is that it has deviated greatly from its original meaning, to the extent that it has lost most of its scientific (methodological) function, namely as a tool of analysis and an agent of production.

Another objection is that capital growth in the highly complex industrialised societies is based on capital charges or arrangement of interest, whereas strict prohibition against usury in Islamic societies makes such arrangements impossible. Cultural heritage and Islamic institutions should therefore be treated as dynamic factors influencing capital development and containing certain elements which might contribute to capital formation. Hence, cultural heritage will be treated as 'immaterial

4. Maxime Rodinson, Islam et Capitalisme, (Paris: Aux Editions du Seuil, 1966) pp. 44 - 73.

capital'. Cultural bias and other aspects of Arabian society have already been introduced for this purpose.⁵

3.1.2. Some Social Determinants of Consumption

Consideration of problems of capital build-up and consumption requires systematic data and accurate records which are lacking. Yet the fact that there is neither documentation nor reliable data does not justify neglecting the prominent role of capital formation. Mere failure to reduce capital formation into a quantitative aspect cannot seriously alter the picture of our analysis. This stems from the nature of our study which is neither rigidly quantitative nor descriptive but rather interpretative. An attempt will be made to base our inferences according to this approach.

Furthermore the study of the evolution of capital in Western Saudi Arabia will not be seriously strained by lack of data and systematic records because the pattern of wealth is quite simple. Increase in the number of palm trees, annual increase in camel population and, indeed, any increase in livestock signify physical increase to the existing wealth. If a bedouin refrains from immediate consumption of his sheep or goats, he has an obvious intention of putting aside a certain part of the wealth or livestock which he has accumulated for productive use.⁶ Indeed, that part which he has deliberately saved for future use is an agrarian

5. Supra, Ch. 2

6. Fieldwork.

investment without which growth of livestock is unattainable. This is, therefore, what the present writer means by capital formation in traditional agriculture. Western Saudi Arabia has a relatively homogeneous society, so the average behaviour of individuals is fairly predictable; the pattern of consumption is governed not only by similarities of patterns of wealth and physical conditions but also by the social philosophy which, in turn, has been created by Islamic teachings and cultural bias.

How can Arabian social philosophy influence the process of capital formation.? The Arabian social philosophy is one of the most serious factors underlying consumption patterns. Unlike most nations where slaughtering sheep or goats is designated for normal consumption, sheep or camels may be slaughtered for purposes of hospitality.

Any bedouin is happily prepared to slaughter a goat or camel for his guests regardless of his financial condition. Slaughtering in this case is not intended for consumption, it is partly induced by what Ibn Khaldun called Asabiyya and partly by Arabian hospitality.

More important, hospitality and social philosophy - which are a product of the past and a consequence of physical conditions - have been blindly transformed into the customs of modern society. Modern society, including

bedouin, recognises that such hospitality represents a heavy legacy because it dictates a serious misuse of hospitality and serious aspect of wealth destruction.

Recognition of such unrealistic hospitality did not occur by accident or as a reaction to adopted culture, it stems from tradition and Islamic teaching which do not approve the destruction of wealth. --One camel or several sheep are slaughtered for one or more guests who will be able to consume only a small part and the rest will be wasted, and such extravagance is a deviation from tradition.

Unfortunately deviation from Islamic principles, although widely recognised in many aspects of life, checks mere recognition of unrealistic hospitality. Moreover, departure from tradition tends to be interpreted as the result of modernisation. Of course those who follow this line of thinking represent a small number of people in the main cities, whereas the majority of the population still rightly believe that Islamic teachings are not confined to the Day of Judgment but that they are a complete system of life which undoubtedly influences the pattern of consumption. Greediness, extreme thriftiness and extravagant consumption have been condemned by Islam whereas balance of consumption has been praised as a real virtue. This is not to say that such teachings have been practically observed, but they are the only standards and the rules which generally

underlie the behaviour and regulate the consumption pattern among the majority of the population.

Indeed the pattern of consumption has been largely altered by the flow of oil revenue into the economy. Gradually, consumption has shifted towards semi-luxurious foreign goods such as radios, watches, and Kerosene stoves. This new trend is substantiated by the documents of trade and statistics where the annual flow of imports shows a significant increase. For example total imports jumped from 2,578 m. Riyals in 1968 to 3,667 in 1971, which reveals that the community as a whole has shifted to more luxurious levels of consumption. More important, composition of imports is strikingly consistent with the above observations. The following table has been derived from SAMA'S Statistical Summary for 1972.

TABLE No. 3.1 Imports Bill

Years	1968	1969	1970	1971
Total Imports in Millions of Riyals	2,578	3,377	3,197	3,667
of which:				
Foodstuffs	796	926	1,011	1,097
Building materials	303	429	384	463
Machinery, electric apparatus, transport equipment	846	1,084	1,018	1,099

Kingdom of Saudi Arabia, Ministry of Finance and National
Economy, Central Department of Statistics, Statistical
Yearbook, 1971 p.54

3.1.3. The Structure of Traditional Markets

The inter-sectoral flows of capital within the traditional economy have emerged as a gradual process. Periodic markets have functioned for several centuries despite difficulties of transportation. In the first place exchange of livestock for agricultural products was, and still is, a common practice in the periodic markets of Abha which still retain this feature of the past. Thus from the present structures of these markets we may infer the contribution of periodic markets to capital formation. Although the number of markets is rapidly declining, due to new transportation developments, their impact on capital formation still persist in the extreme south and north of the Hijaz. Obviously our inference is not based on systematic records of agricultural transactions but on the logical trends of crop prices and animal produce such as dried milk, butter, and cattle hides. Indeed, the traditional economy witnessed conspicuously stable prices up to the 1960's, except for the seasonal fluctuation and the impact of pilgrims on most western parts of the country. Factors which succeeded in keeping the prices down are not hard to explain. They can be related to patterns of consumption and the simplicity of economic structures. That is because prices were consistent with the market structure where the general tendency to consume or to invest has been governed

by the low level of income. In this light, peasant behaviour has been motivated by two factors:

1. Yields of agriculture and cattle tend to follow a cyclical path. An increase in agricultural crops, which is enough to fulfill the market's need, tends to be followed by a decrease in agricultural products and cattle which in turn may end with a relatively long period of shortage.

2. Sudden fluctuations in cattle prices occur as a natural result of the wealth structure. The author's experience with the periodic markets makes it possible to conclude that acts of selling cattle or butter are hardly motivated by the market conditions. Even today selling cattle is far from a positive response to increasing prices. The main reason is associated with bedouin failure to capture opportunities of increasing cattle prices.

There are two reasons for such passive attitudes. Firstly, timing associated with the traditional attitude is inept. Sheep, camels and goats never mean mere wealth to the bedouin; they are symbols of social prestige which is usually desired for its own sake. So as long as he can afford food and clothing he either has no intention of selling part of his herd or he visualises the selling time as still remote. Thus his response to prices is very weak, and even if he is inclined to be influenced by rising prices the strong

attachment to his cattle tends to outweigh the influence of prices.

The time to sell will only come at the moment when the basic provisions, i.e. food and clothing are running short. However, if he is lucky enough, his poor timing may coincide with rising prices; yet, in terms of saving money as a form of capital, it is still not good timing because instead of saving money most of it will go on consumption.

Undoubtedly, even if passive attitudes acted negatively against capital formation, it is not because the seller gets less money than he should but also because livestock are sold under unfavourable conditions; capital formation is that if links between the modern markets in the main cities and the traditional ones are not forged, capital formation within traditional agriculture may continue to retain most of its features for several decades to come. Gradual improvements have, however, made the marketing system in villages and towns, surrounding Madina and Jeddah more effective than before. Proximity to villages and towns is a decisive factor in capital formation, e.g., Al-Jafor and Khayber are greatly benefiting from Madina because the latter is not only a good market for agricultural products of the surrounding villages but also acts as the centre of a communications network, making some

Western region's products available to Riyadh and other cities of the Kingdom.

3.1.4. Commercial Prosperity Versus Capital Formation

It is incorrect to assume that commercial prosperity which helped agricultural transformation in some countries - of different physical and social conditions to Saudi Arabia - is a necessary condition for capital formation. The actual role of local markets at village level is not confined to the diffusion of commerce on a large scale. That is because prosperity due to commercialisation is unlikely to develop where a dispersed population is combined with poor transportation. Commercial conditions and the small volume of economic activities are the main feature of Western Saudi Arabia. What these facts suggest is that unless we abandon the false assumption that commercial prosperity of the Western type is a necessary condition, our understanding of the nature of capital formation is far from accurate. Indeed, despite clear defects of local markets, they have functioned reasonably well as financial centres. Whether such an agrarian society possesses adequate capacity to generate additional capital is a complex issue however.

Animal wealth is one type of traditional capital which has contributed to commercial prosperity in most of

Western Saudi Arabia, as Table No. 3.2. shows. The relative concentration of goats and sheep in Makka, Asir and Madina signifies the roaring livestock trade in such areas. Makka is the well-cited classical example of flourishing trade in both pre-Islamic and subsequent history.

3.1.5. Pilgrimage and Sacrificial Animals

One source of capital evolution in the country in general, and in the Western part in particular, may be attributed to the annual flows of pilgrims to the Holy Cities, Mecca and Medina. We have, in fact, a special pattern of traditional markets which has developed in two forms, both of them making significant contributions to capital formation. One is the periodic market which is based on pilgrimage and the other is the ordinary local market.

There are few documents or systematic records to show how the pilgrimage alters the structure of the demand for agricultural products, yet it is an historical fact that pilgrims have been a main source of government revenue for at least 13 centuries and served to stimulate the periodic markets. For example, the government estimated in 1965 that pilgrimage expenditure was equivalent to 1160 million Riyals of goods and services.

Furthermore, since the actual number of annual pilgrims has jumped from 49,517 in 1936 to 719,040 in

Table No. 3.2.

Estimated number of Winter 1972 Livestock and Poultry by Amarats*

	<u>poultry</u>	<u>goats</u>	<u>sheep</u>	<u>cattle</u>	<u>camels</u>	<u>asses</u>	<u>mules</u>	<u>horses</u>
Kingdom	331,315	755,210	1,237,770	185,920	58,652	99,076	41	1030
Northern Hijaz	27,311	15,117	8,760	424	1,445	353	18	16
Al-Madina	2,886	40,866	13,379	966	1,997	233		101
Mecca	9,626	173,881	258,702	37,268	22,968	15,215		
Asir	42,398	192,936	326,284	41,127	9,705	24,639		194
Jizan	3,282	75,054	46,885	30,113	9,134	21,376	14	97
Najran	4,872	22,635	10,994	3,468	1,909	10,245		508

Source : Census of Agriculture, 1973

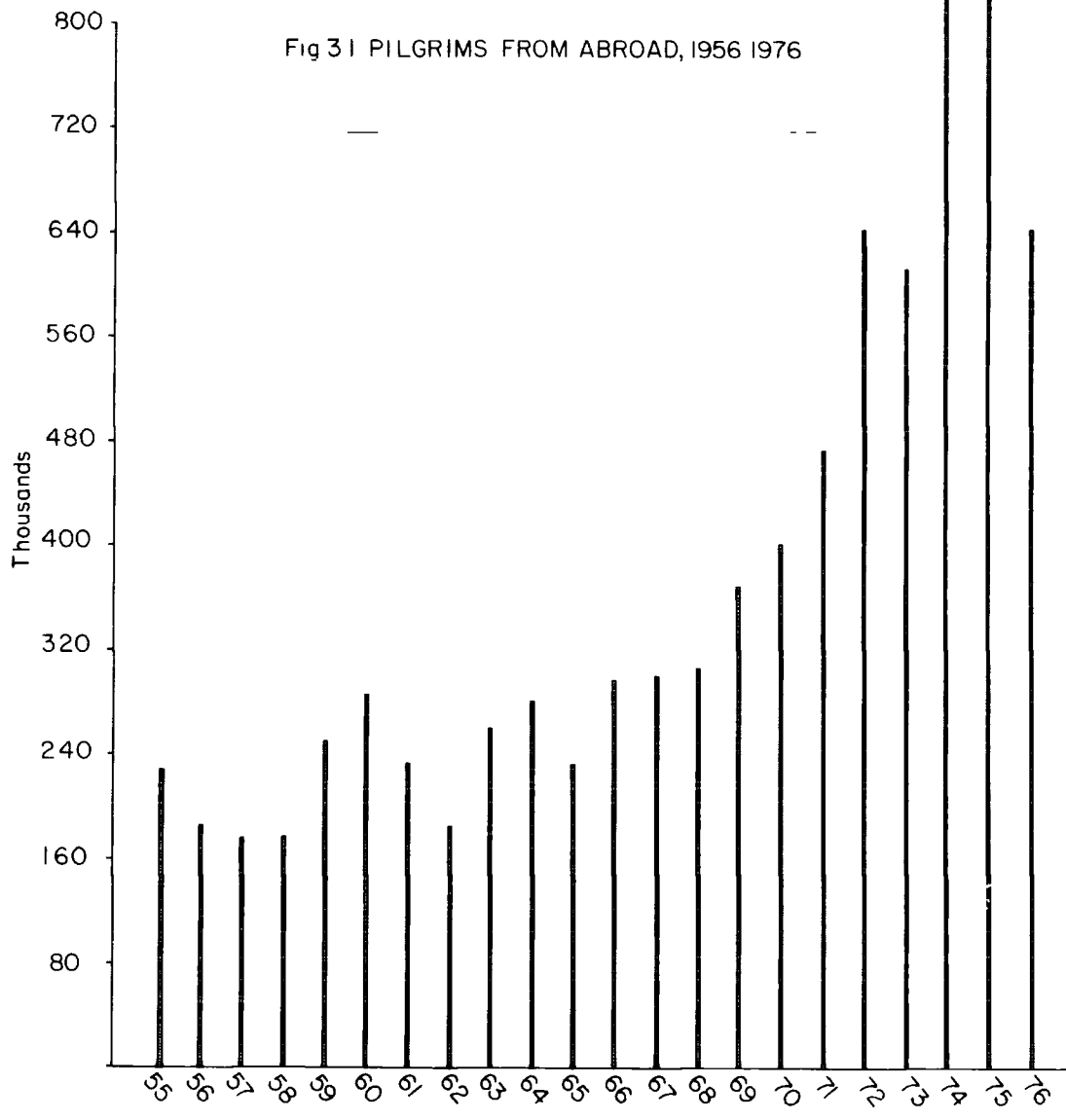
* Amarats refers to administrative provinces

1976 (Fig. 3.1.) it is reasonable to assume that the spending on goods and services is following the same general trends. 1955 has been selected as a base year because the 1950's mark the beginning of such trends. The increasing flows of expenditures by pilgrims is expected to contribute to capital formation in various ways:

1. Caravan movements have created active markets in the areas surrounding caravan routes. It is true that the previous advantages of traditional methods of dealing with pilgrimages have disappeared, yet the accumulated experience of long-established villages in the marketing of agricultural products remains. Pilgrims have converted the local markets into international markets where exchange of goods and services have shaken the very structures of local markets.

2. The vulnerability of traditional agriculture and flows of foreign money to relatively small markets tend to stimulate capital formation in a reasonably effective way. Since cattle prices always increase at the beginning of every pilgrimage, intermediaries or 'middlemen' tend to raise the number of goats, sheep, cows and camels every year in order to get advantage of rising prices.

Despite the advantageous position of Western Saudi Arabia which has greatly contributed to capital development there are developing elements against capital formation.



Pilgrims who, until recently, have been a source of both income and capital are becoming potential initiators of capital decline. For, unless the government adopt immediate measures to make use of sacrificial animals, hajj may inflict damage on capital formation in the area of livestock. In 1963 it has been estimated that 300,000 sheep or goats were slaughtered by non-Saudis and another 200,000 by Saudi pilgrims. This makes a total at least of 500,000 animals slaughtered within three days in Makka.⁷ The same report estimated that not more than 32% of the meat of sacrificial animals was consumed, giving rise to the following astonishing statement :

"The loss in meat has been estimated at about three million kilograms or of a value of S.R.13,330,000 (\$ 3,000,300)" ⁸

Furthermore, since the growth of pilgrims has more than trebled since 1963, it follows that destruction of capital is taking place in proportion to the pilgrim increase (Table No.1.1.) or very close to it.

While sacrificial animals come from various parts of the country, Western Saudi Arabia seems to supply a greater proportion than any other province of the Kingdom.

7. FAO Report to the Government of Saudi Arabia on Pasture Development and Range Management with Respect to Increasing Livestock (Rome, 1965), p.19.

8. Ibid, p.19

This implies that Western Saudi Arabia livestock are more affected by the sacrifice of pilgrims than others because lack of adequate transportation facilities tends to discourage the flow of animals from other parts of the country. It is true that transportation of animals by motor car makes for a steady supply of goats and sheep at Makka from most of the Kingdom but, due to cost of transportation, Hijaz livestock enjoy a relatively competitive price and seem attractive for sacrificial purposes.

One solution to convert the destruction of livestock into viable capital formation is to restrict sacrifices to male sheep and goats as long as they are religiously acceptable. This can be backed either by subsidies or by importation from abroad. Another radical solution is to get a livestock factory started either in Jedda or Makka, to mark the foundation of a canned meat industry in Western Saudi Arabia.

3.1.6. Locational Aspects

A noticeable improvement in agricultural productivity has been achieved in Western Saudi Arabia since the 1960's in two ways.

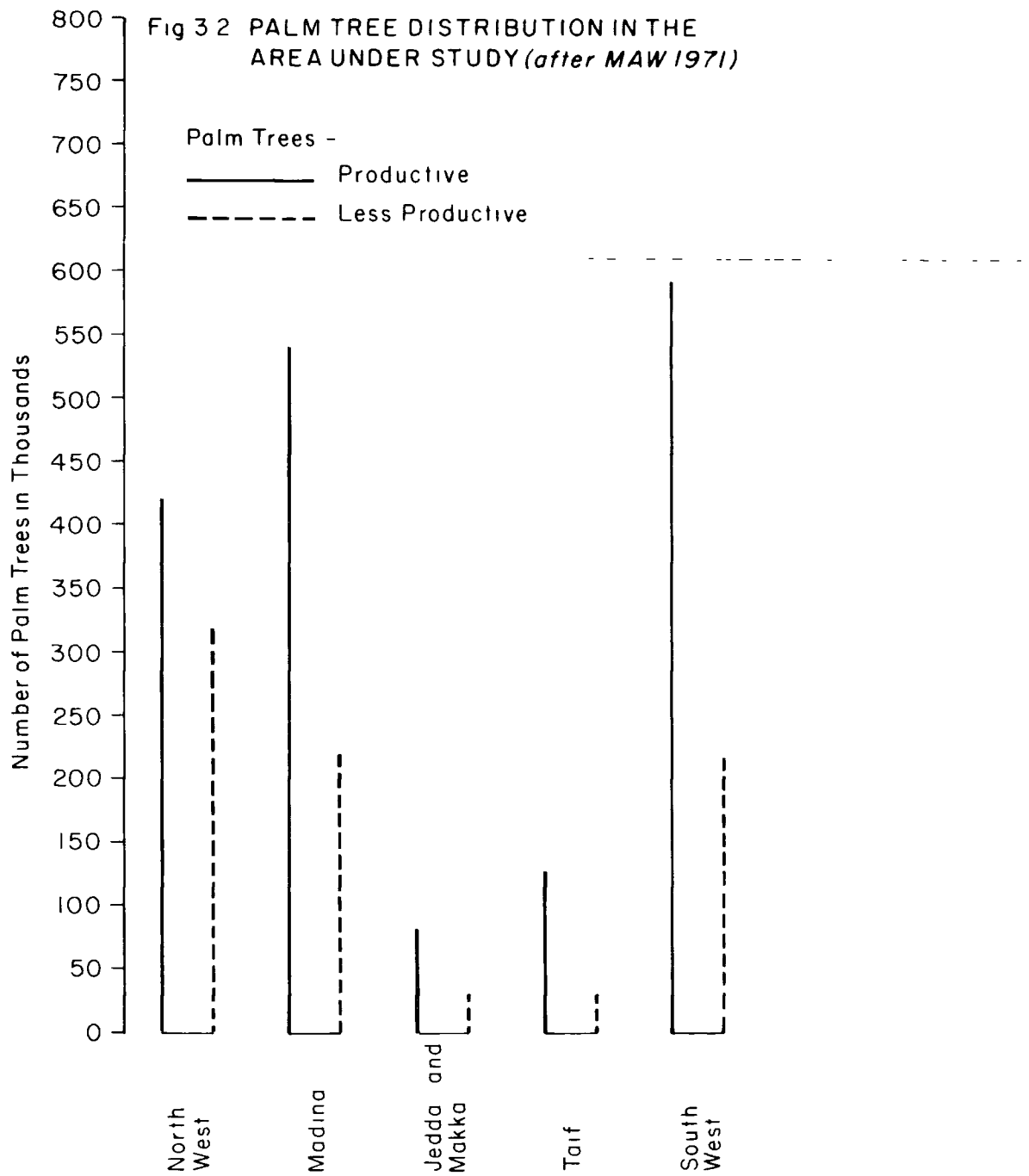
First, growth of commercial activities in Madina, Jedda, Makka and Taif has tended to encourage specialisation in particular agricultural products, i.e. tomatoes, vegetables

and water melons. Wadi Fatema, Al-Jafor, and the newly developing areas are major suppliers of tomatoes and vegetables, not only to the Hijaz towns but also to most of the main cities of the Kingdom. Yields from such crops are usually transformed into capital, i.e., digging new wells and buying equipment. Second, locational changes and new market forces are altering most traditional agricultural activities. Milk, meat and butter are produced in tribal areas to be sold to middlemen in towns such as Khayber and Abha who in turn transfer such products to the towns. They usually buy cattle and agricultural products at low prices and sell them at relatively high ones. Fortunately this sort of exploitation is diminishing because most of agricultural products are delivered directly to the main markets by the farmers themselves.

The pattern of tree- palm distribution signifies the locational aspect of agricultural activities, particularly in the south west of Saudi Arabia and Madina. These locations are classical examples of specialised traditional agriculture, Fig. 3.2.- Palm Tree Distribution in the Area Under Study - which although it has lost most of its importance is still worth government support.

3.1.7. New Spatial Relationships

The old relationships between towns and their surroundings are undergoing rapid changes, particularly in



Jedda and Madina. Such changes involve the marketing system and hierarchical structure.

The marketing system was, until recently, based on old traditional specialisation of villages and towns where the former supply the towns with agricultural products and animals while, at the same time, towns provide services and goods. Most of the tribal areas supply towns with traditional products and grains. Distribution of these goods is dominated by middlemen who buy traditional products from their original places and sell them in the main towns.

By maintaining this service, the middlemen are helping the relationships between towns and tribal districts to function according to particular economic ties. Moreover, services of middlemen are an important link in the chain of agricultural production and exchange. Yet, despite the essential role of middlemen in the process of agricultural distribution, they represent a potential danger to agricultural transformation in Western Saudi Arabia. For one thing they are creating an artificial market, i.e., buying animals and agricultural products at relatively low prices and selling them at high prices. The farmer who gets less price for his produce than he deserves may be discouraged to produce certain goods while the consumer who pays a high price can shift to imported food.

One cannot generalise on these problems, but the present writer has the feeling that some of the periodic markets in Western Saudi Arabia are victims of uncontrolled middlemen marketing activities. Perhaps for this reason periodic markets of villages, e.g. Wadi Al-Safra and Abha region are declining and, in fact, some have already disappeared. Whatever the cause, one factor is sure, the old hierarchical structure of Western Saudi Arabia's marketing system is no longer consistent with the present agricultural development and the changing nature of the growing towns of Jedda, Makka and Madina. Two types of marketing agriculture are developing on two main fronts : wholesale marketing, in which the farmer sells his products directly every morning, and the middlemen market which, although charging higher prices, is subject to government inspection.

Two recent geographical studies devoted to Jedda and Madina stress the changing nature of space relationships, i.e., the developing spatial pattern that tends to create new economic links among and between the various areas of Western Saudi Arabia. The first study is in a new series aimed at investigating the development of the Saudi Arabian cities, starting with the development of Jedda from 1814 until 1974. This study⁹ maintains that the increased population

9. Al-Khafji, vol. 4, (July, 1976) p.20.

(from 60,000 in 1946 to 501,000 in 1974) has given rise to certain fundamental changes in both the city's physical structure and its marketing pattern. The study shows the manner in which the old market places have been converted into central business districts. True, the authors of the series have not made this distinction, i.e., the gradual change of certain parts of the cities from market places devoted to selling agricultural products to central business districts, yet careful study of their findings reveal such an important distinction if the land use and the physical structure of the cities are taken into account. For example, the authors analyse the population which has led to a constant expansion of Jedda in various directions. New patterns of land use are another element which has an immediate bearing on the developing spatial relationships. A similar study has been made of Madina, emphasising the changing spatial relationships and what is called the 'regional mobility' which tends to encourage flows of agricultural products. In both studies, the functional interaction between the main towns and the surrounding areas is stressed.

Thus the new spatial relationships in Western Saudi Arabia are making an important contribution to capital formation in two ways: encouragement of specialisation in various locations, and creating better conditions for improving human skills.

3.2. Source of Capital Supply within Traditional Agriculture

Capital formation within traditional agriculture is highly responsive to the financial structure. Not only can small farm holdings be financed with small amounts of money but also the type of financial institutions tend to make self-financing the principal arrangement. Indeed conspicuous consumption might paralyse the supply of capital, yet two main forms of financial system prevail : savings and deferred payments. From small savings the workers are paid and via deferred payment new works take place. In fact the relation between farmers and workers is not based on work only, as is the relation between manufacturers and workers. Usually, workers are either relatives or members of the same tribe;¹⁰ the tribal bonds and considerations are therefore strong enough to induce workers to the field. It is precisely the Asabiyya concept which made work in the field above and beyond the need for immediate payment. The contribution of Asabiyya to capital formation will be developed more fully towards the end of this section; it is sufficient to say at this point that development of deferred payments would not have occurred without Asabiyya because, even if the incentive of money is

10. Source: Field work in Abha, 1973.

an important element, the non-existence of a credit system and scarce money might shake confidence in the financial capability of a farmer to pay his debts (workers' wages). In brief, what made deferred payments possible is the mutual obligation of Asabiyya.

This is not to deny the limitations of insufficient savings to make expansion of agrarian capital possible, but to emphasise the historical fact that traditional agriculture not only generates reasonable capital to maintain itself but also possesses a 'built-in' social security. More important, in the early phases of agricultural transformation, farmers are unlikely to get the advantage of expanding demand for agricultural products because they have no access to modern credit facilities. Thus deferred payment arrangements have served admirably to help those who are unable to get credit.

Fortunately, recent expansion of demand for agricultural products has facilitated capital formation in a gradual manner, despite the fact that absence of adequate transportation facilities has remained as a constant check on the flow of goods and services essential for quick capital formation. Thanks to a self-financing system which facilitated capital formation, growing demand for agricultural produce has exerted significant pressures on the farmers to cut their consumption in order to increase the volume of

their sales. Farmers of Al-Figra and Al-Jafor (both located west of Madina , 80 and 120 kilometers respectively) are typical of most present farming systems in the area. These farmers are far from being aware of the theories of capital accumulation. However, they are aware of the profits which they can gain by abstinence from current consumption for future use. One positive consequence of this awareness stems from their frequent contact in the major cities, such as Madina , and the villages which functioned for several centuries along and around the highways connecting Makka, Jedda and Madina . The awareness of small farmers of the importance of capital has been created by their experience. Producing cash crops is not possible without good timing and reasonable preparation. As a point in case, the writer has noticed that most farmers in Western Saudi Arabia switched over to specialized production. Fortunately, such specialisation tends to coincide with a shortage of food supply in the local markets. Cereals and dates in the Figra mountains come late in harvesting season. Fresh dates of excellent varieties tend to create a 'seller's market' which means relatively high prices for the produce. Probably this is one of few occasions where local markets act favourably on the farmers' side. On one hand they will be able to buy their food and semi-luxurious goods, such as tea, coffee and spices, and save a reasonable amount from their proceeds for traditional

investment. However, their foresight for future developments such as harvest failure, floods and frost has usually been challenged by unexpected events, including price instability of their crop. Yet some farmers tend to place too much confidence in future developments, and to borrow as much as they can to finance their activities, so that once their expectations have proved wrong, getting into debt has been an unavoidable consequence.

It is in the nature of the traditional economy that the agricultural sector lacks institutional support. However, one must not conclude that getting into debt can be prevented by lending institutions because, whatever the contingencies and precautions might be, getting into debt can occur in agrarian societies as easily as bankruptcy occurs in the well-capitalized small industries. If, however, we exclude exceptional cases from the general tendency, husbandry and most related agricultural activities have been financed by traditional methods; thus reasonable amounts of savings have found their way into capital formation. Some disadvantages of non-institutional lending are obvious. Absence of risk distribution through insurance companies has acted against capital formation. In this regard a distinction should be made between scarcity of money for lending purposes for individuals and the shortage of supplies of money in the agricultural sector as a whole.

Risk considerations have contributed to the habit of money hoarding in strange places. However, we should not exaggerate hoarding practices unless we are able to distinguish between the various intentions of hoarding. Misunderstanding in this connection is indirectly related to two main concepts, both of them are hardly accurate.

-- One may explain the hoarding tendency as human impulse. Those who follow this line of thinking tend to push their argument so far to the extent that they accuse the bedouin of being avaricious. Another notion is the traditional one which equates hoarding with keeping money idle. Both of the arguments postulated ignore the possibility that hoarding could be a positive element in capital accumulation. Of course hoarding as an individual behaviour depends on the farmer's intention and his final action yet the general situation, as we understand it, is that hoarding is usually aimed at capital accumulation. Hoarding money to buy seeds and additional livestock is a common practice. It goes without saying that this type of hoarding is a normal practice of capital formation. To refrain from current consumption is a first step to invest, yet in this case, a decision to hoard could take place without clear intention or purpose of hoarding. An act of abstinence might occur for hoarding's sake alone; however, there may be a moment where both intention and decision coincide to buy additional

livestock or to improve productive techniques.

The financial arrangements which developed within the traditional agriculture have contributed to capital formation in three ways¹¹ :

1. Hoarding tends to shrink money circulation, yet it developed as a special type of investment, i.e. it is not being spent.

2. Money flow from traditional sources, such as friends, tribe members, shopkeepers, tends to mitigate the scarcity of money needed to finance the small agrarian projects.

3. Self-financing was, and probably still is, the major source of capital supply.

3.2.1. Asabiyya as a Mutual Obligation for Capital Creation

The structure of society in Arabia, as indeed in any society, has affected capital growth in a variety of ways. Tribal ties which cut across the society have served permanent mutual interests. As explained in the previous chapter, tribal interests and loyalties have not only held the community together but have also succeeded in generating special co-operation in economic life. It is unique co-operation in the sense that the incentive universally called awneh arises from mutual obligation rather than from

11. M.M. Raddady, "Economic Development in Transitional Society" Al-Khafji 6 (March 1974): 12.

immediate rewards. Under awneh, meaning "assistance", the farmer is entitled to dig a well, to build a house or a fence, and to plough the soil without any payment to the working people : regardless of their number. His responsibility is only to provide food and shelter during the working days. Thus, when it becomes clear to the farmer - that digging a well costs several thousand Saudi Riyals, which usually far exceeds his financial capability, his project is rarely hindered by lack of capital. Obviously, those who leave their fields to work for awneh cannot escape certain losses equivalent to the time and effort involved in awneh. However, this rarely happens because this type of co-operation does not take place once and between only two farmers. It takes place many times and with as many individuals as there are in the tribe. To be more specific, Asabya as a social device contributes to capital formation in three distinct ways.

3.2.2. Credit Facilitation

1. In traditional agriculture, credit arrangements are almost absent and traditional loan chances are decreased by the low level of income. These conditions contrast sharply with mechanized agriculture in industrialised nations where credit facilities and rising levels of income can make a significant contribution to capital formation. Furthermore,

even when hoarding can make a loan possible, the weakness of the economic base of the farmer means that he is ineligible for loans. Nevertheless, awna, which stems from the asabiyya considerations tends to serve as deferred payments without money.

3.2.3. Farm Size Limitations

A small farm in Western Saudi Arabia is influenced by the extent of water supply and land conditions. These are major factors that tend to make small holdings a general pattern. As Table 3.3. shows, 55.57% of holdings are under 10 dunums. This fact has been a major obstacle in the absorption of relatively large-scale capital. Nevertheless, it does not exclude the possibility of recruiting unutilized labour. Of course labour shortage in the country as a whole has been reported but it may well be that the existing labour force in the agricultural sector is either idle or not fully utilized (except at peak seasons). Thus when individual incentives and attitudes towards work collaborate with unfavourable physical conditions against full utilization of economic resources, asabiyya emerges as a practical arrangement for labour utilization.

3.2.4. Usury Implications

Interest or charge on capital is prohibited (except

Table No. 3.3.

Distribution of Holdings in the Kingdom according to Size

and Type of Tenure

Size of Holdings (Donums-0.1 Ha)	Owned Holdings Number	Owned Holdings %	Rented Holdings Number	Rented Holdings %	Mixed Holdings Number	Mixed Holdings %	Total % Number	Total % %
Less than 10	75333	56.10	1362	42.70	368	30.82	77063	55.57
From 10 to less than 30	27235	20.28	654	20.50	309	25.88	28198	20.34
From 30 to less than 100	21370	15.92	553	17.34	270	22.61	22193	16.00
More than 100	10345	7.70	621	19.46	247	20.69	11213	8.09
	134283	100.00	3190	100.00	1194	100.00	138667	100.00

Source . M A W 1973.

in rare cases) through the manipulation of the term "interest", i.e. the words "commission" or "services" are sometimes inserted in places of interest). This undoubtedly tends to discourage money circulation. The possibilities of getting loans are remote. Fortunately this situation has been reasonably compensated for by the asabiyya arrangement. This compensation is brought about in the following manner. In industrialised countries interest is charged on money for its utilisation for productive and consumption purposes and is a practical device enabling the release of unutilised resources. Its effectiveness, however, is derived from the industrial institutions and the banking services which make interest work properly.

These conditions are lacking in Saudi Arabia. More important, individuals in industrialised nations believe in their own well-established institutions. However, people in Saudi Arabia tend to follow the traditional Islamic institutions.

3.2.5. Asabiyya in Geographical Guise

A review of market development in Western Saudi Arabia would be incomplete without taking asabiyya into consideration. This stems from the fact that the Arabs' decision to herd and to cultivate is affected by his past and

by certain circumstances governing his locational activities. For one thing co-operation based on asabiyya is strong among members of tribes but become weaker and less effective outside the tribes and their members or territories. It is because of these factors that various Hijaz tribal territories and villages are ceasing to function as producing units, since most tribes and farmers cannot perform their agricultural activities beyond their traditional territories. Even when such tribal territories have been replaced by one single national territory, tribes in the extreme North and South of Hijaz remained relatively faithful to the old geographical division which, in fact, asabiyya motivated.

To appreciate the significance of this one must examine, for example, the demarcation line between Harb and Johainah tribes. The territories of the former extend from Makka to Northern Madina where the territories of the latter begin. Each tribal member is confined almost entirely to his tribal territory partly for reasons of social security, i.e. in tribal concept; and partly because the "Deerah" (tribal district) is not merely a location but a perception of place enhanced by asabiyya consideration. One final example, from Western Saudi Arabia, some oases and names of places signify tribal names, e.g. Al-Harbiyya (Harb territory), Al-Johaniyya (Johainah territory). Furthermore, the links within such territories are largely dominated by asabiyya forces which

in turn affect the traditional social organisation and shape the way in which co-operation take place.¹²

3.3. New Trends Affecting Modern Capital

Development

3.3.1. Elements of Modern Capital Defined

To what extent does modern capital contribute to agricultural transformation? To deal with this question, even in a broad way, further clarification is needed of the term 'capital'. For the purpose of this study the term capital is intended to include any improvement in agricultural techniques of production, both physical and cultural. The former includes land development, construction, machinery and equipment. The latter includes any improvements in human skills, such as technical education and training. In this respect, attitudes towards work, traits (both Asabian and cultural

12. These observations are based on fieldwork in Abha and Madina in 1973.

bias) and individual orientations which interfere directly or indirectly in capital formation are included. Justification for these components of capital formation springs from the fact that modern capital involves four inputs to agriculture . land, labour, working capital which in turn includes fertilizers, insecticides, pest control and improvement, whereas fixed capital constitutes irrigation, dams and wells, and finally co-operation.

One aspect of this classification is that, in traditional agriculture working capital takes the form of grain reserved for seed, human manure and animal manure. Techniques of production, involving these features constitute a great deal of working capital, which reflects the fact that capital formation has been traditionally short-term orientated, unlike the present trend of modern capital where fixed capital is long-term motivated.

More important, adoption of new techniques of production tends to influence the traditional organisation. This is not to say that tribal organisation exhibits a tendency to reorganise itself in the process of adopting new techniques. On the contrary, family ties and tribal bonds are as strong as before. The

geographical locations tend to enforce the old tribal concepts in new forms. In the first place the co-operative organisations, which are new trends in Saudi Arabia, have been created to facilitate purchasing new machinery, equipment and technical services, and yet their members come from the same tribe.¹³ Any co-operative organisation is in theory open to any farmer who desires to become a member. However, the majority of co-operatives in most of the western parts of the country, exhibit tribal concentration. Tribal concentration in one or more organisations has been reinforced by two determinants. Recent improvements in transportation have facilitated communication among non-tribal members many of whom remain in remote areas. So, the development of co-operative organisations cannot be achieved unless tribal concepts are appreciated. This is to say that co-operative constitutions, regulations and functions are of secondary importance, whereas Asabiyya concepts are the prime mover. The growth of co-operatives in Abha is a case in point, since they have developed on a tribal basis.

13. Interview with the Manager of Agricultural Unit in Abha 1974.

Agricultural institutions such as the Ministry of Agriculture and the Agricultural Bank are also new trends in reconstructing traditional agricultural organisation. They are intended to disseminate new agricultural techniques. There is no study to show the extent of co-operation between the co-operatives and these agricultural institutions, yet we could infer that mere financial links between them underlie their functions. Therefore, the annual flows of capital which have made these institutions possible tend to diffuse innovation vertically and horizontally. Horizontal dissemination has been reinforced by both the individual's initiative and co-operative organisation, whereas vertical diffusion has been created by the market forces of supply and demand. Modern capital development in Western Saudi Arabia takes five forms: traditional fertilizers; improvement in irrigation; introduction to high yielding varieties; circulation of goods and services; and government participation.

3.3.2. Increasing Use of traditional fertilizers

Using human and animal manure was, until recently, confined to the main towns for two reasons. Firstly, some farmers are reluctant to employ either human or animal manure because they believe that such fertilizers might contaminate their agricultural products. This suspicion

(not altogether unfounded) is gradually disappearing because of the activities of experimental stations which supply farmers with free fertilizers, and partly because the relatively intensive use of fertilizers on large farms has proved to the average farmer an absence of contamination and potential productivities.

The second reason lies in the problems of manure location and the distances associated with moving it from its source to areas of utilisation. Much of the manure in Madina, Jedda and Makka is unused due to lack of transportation facilities. Human and animal manure is usually transferred to cultivated areas in crude form, a fact which makes transportation costs far exceed purchasing price, which is often minimal. Introduction of new roads and government subsidies are mitigating costs and encouraging factors.

3.3.3. Irrigation Improvements

Water scarcity in Western Saudi Arabia is a major challenge to improving agricultural production, a problem to which the farmers are responding in two ways. One is an improvement of irrigation methods within the existing plots, that is to say, "intensive irrigation". The other is a similar improvement but requires new land development and new wells, that is to say "extensive irrigation

improvement". The capacity of old wells is often exhausted due to their lengthy period of service. Wells in Madina and Wadi Fatema are historical examples of this problem. Recent introduction of pumping engines has made it clear to the farmers that the capacity of some wells are incompatible with such an irrigation technique because it is only a matter of a few hours of pumping before water stops flowing. Additional wells have therefore been dug, and other improvements have been introduced in the existing wells.

These new trends face the farmers with two choices, i.e., either to abandon the introduction of new pumps or to increase the capacities of their wells. Indeed numerous plots in Madina and Wadi Fatema have been abandoned due to inadequate underground water resources. This is why two or more wells in one single plot is a new phenomenon in the agricultural transformation of Western Saudi Arabia.

Water shortage in the main towns of Western Saudi Arabia is contributing to widespread abandonment of old traditional farms. This is a new phenomenon which has been reinforced both by population pressure on water supply for urban use and incapacity of certain old wells to produce more water for irrigation. Suwaidrah, Solsola, and Al-Zobair, to mention a few, are modern villages with

a relatively new irrigation system based on the introduction of pumping engines. This represents a gradual expansion of cultivated areas in Western Saudi Arabia (Fig 1.2.) and extension of the traditional limits of the towns.

3.3.4. High Yielding Varieties

Introduction of high yielding varieties is another major development. The present trends which fostered building up modern capital and agricultural techniques have led to a noticeable increase in the overall agricultural output. High yielding varieties such as Maxipal rice have made agricultural transformation possible. Over the last few years experiments with new seeds have proved them definitely superior to most of the traditional varieties. Yet one must not underestimate the potential quality of the traditional varieties which have survived under unfavourable physical conditions. The gradual increase of cereal production is undoubtedly a good sign of a 'break-through' in agricultural transformation processes.

3.4. Government Participation in the Capital Market

Experience in Western Saudi Arabia reveals that neither agricultural institutions nor infrastructures alone can achieve rapid agricultural development without the

creating of a capital market. This is particularly true in the sphere of marketing and the distribution of imported equipment designed for agricultural purposes.¹⁴

3.4.1. Marketing Agricultural Equipment

Creating a capital market is undertaken by encouraging individuals to buy and sell pieces of equipment such as pumping engines and their spare parts. One dramatic aspect of marketing capital of this sort is that some small shops in Jedda and Madina have shifted their activities from mere buying and selling of agricultural equipment and have become specialised agencies for international firms providing agricultural machinery. Such local agencies are able to facilitate credit and to arrange deferred payments for the farmers.

3.4.2. Distribution Difficulties

The marketing of agricultural equipment is limited almost entirely to Jedda, Madina and Makka. Farmers in the surrounding villages are facing the problems of delivery and increasing transportation costs, especially in the case of bulky equipment. Another problem is that of "agricultural marketing services". Hiring tractors for

14. Al-Madina Newspaper, (June, 1977), p.2.

ploughing requires beaucratic filling out of application forms after which, and often with much delay, contracts may be approved by the private agencies. The private agencies are unlike the government agencies (M.A.W. and A. Bank) and extend their activities beyond the town limits only on payment of an additional charge. The government deals with this problem by encouraging the establishment of co-operatives in the remote areas. Most of the co-operatives are overcoming problems of credit and distribution at the local level.

3.4.3. Circulation and Locational Adjustments

The spread of modern capital in Western Saudi Arabia is a developing element in the processes of transforming traditional agriculture for three main reasons : it has improved techniques of irrigation; changed the marketing system; and created new cultivated areas.

3.4.4. Alteration of the Marketing System

Market size and structure are undergoing considerable change. The extent of overseas markets has already extended well beyond the previous limits. The Kingdom exports increased from over eight million S.R. in 1969¹⁵

15. Kingdom of Saudi Arabia, General Department of Statistics, Foreign Trade Statistics 1969, pp.828 - 860.

to more than nine million S.R. in 1971,¹⁶ as Table shows. This limited growth derives its significance not so much from its monetary value but from its composition. Live animals and fruit constituted more than half of these exports. This situation suggests two important factors: firstly, production of these categories are encouraged by international prices which enable Western Saudi Arabian products to cross national borders to neighbouring countries; and secondly, a shift to this type of agricultural activity is a good signal for capital accumulation.

Increasing agricultural prices, nationally and internationally, has encouraged farmers to move away from the vicinity of the Madina-Jedda road but they have found it extremely difficult to market their products due to lack of transportation facilities. For this reason farming in the extreme north and south of Western Saudi Arabia is still less attractive for capital formation and improving techniques than other parts of the Hijaz. It is no exaggeration to say that Abha and Figra are among the best lands in terms of productivity and water availability. Yet transportation difficulties have deprived them of capital development. Farmers in the most distant parts are not really exploiting their land as they should be and some plots have remained uncultivated for years because transportation costs have

16. Kingdom of Saudi Arabia, General Department of Statistics, Foreign Trade Statistics 1971 pp.362 - 374

tended to exceed the crop's value. Some of those locations have been abandoned.

Locational adjustment in Western Saudi Arabia is taking two forms: creation of new cultivated areas and abandonment of certain old areas or certain methods of production. In the course of recent agricultural transformation the local farmers of Madina and Yunbu have moved away from their traditional places : mostly date-producing areas. Due to the growth of the towns they have been forced to sell their wells and land to the authorities for urban water supply or for some other similar purpose. These developments have featured movements of farmers and capital as new elements in locational adjustments. Subsequently the decline of old products such as the date palm and the rise of new crops have greatly contributed to agricultural diversification.

Production and consumption are shifting in favour of fruit and vegetables because these crops are not only considered as a rapid method of transforming money into capital but are also preferred from the consumer point of view. It is these trends that are accelerating the processes of locational adjustment, partly because the need for modern capital is exerting considerable pressure on farmers to improve their techniques of production, and partly because exhaustion of underground water, coupled with urban water

supply problems has made the abandonment of old locations and the development of new ones almost imperative.

3.4.5. Spatial Variation Problems

As implied when discussing locational adjustments, spatial diversities have involved a certain degree of synchronization, i.e. short-term capital flows and long-term capital flows.

3.4.6. Short-term Capital Flows

Movements of resources in Western Saudi Arabia are taking the form of money transfer both from towns to cultivated areas on the one hand, and also in the opposite direction. Cultivation of tomatoes and watermelons in Wadi Al-Jafor and Wadi Al-Hamdh has indeed converted some areas previously used for grazing into areas of active cultivation. Areas that lie within the tongue or the strip represent a vivid example of the way in which capital movements connect these areas with the main towns. The grazing areas are undoubtedly affected by these developments because wadis are not only places where herbs and bushes grow to feed animals but also potential areas for irrigation. The new linkages in this changing land use may involve possible maladjustment, particularly in Wadi Al-Hamdh where sheep and goats are compelled in certain cases to

move a relatively long distance when the supply of water runs short. Under such circumstances livestock are susceptible to loss of weight and eventually to diminish in numbers.

Production of alfalfa in these wadis is helping to prevent further capital losses, i.e. of sheep and goats; but most of the herds have migrated to relatively remote areas in North Hijaz where marketing livestock has proved to be difficult and economically unviable because it takes several days by truck before market places are reached.

3.4.7. Long-Term Capital Flows

For the purpose of this study land, wells and the date palm are considered to be long-term capital. They themselves are immobile, but their circulation is possible by means of money flow; otherwise the present processes of adjustment would be unlikely to happen. Removal of most of Madina's forest is an obvious example of locational adjustment via capital flows in Western Saudi Arabia. This forest is located a few miles north west of Madina, on the edge of the old traditional cultivated belt.

Both rent and price of land are determined by location and water supply prospects. The more the farmers move away from towns and villages the lower is the price they pay for land. Geographical elements are influential

factors in this regard. Distance from the main Western Saudi Arabian roads is inversely affecting land price where directions of valleys determine the exact locations of water and cultivation. In consequence, two forms of land expansion are being created: dispersion on the one hand, and concentration on the other. Scattered cultivated areas on the top of Al-Figrah and Abha mountains are old patterns involving fluctuating land values and prices. This is unlike price levels in concentrated development which tend to push land prices up but within the same range over the whole area. The major unifying forces underlying circulation and locational adjustments lie in availability of underground water and extent of transportation facilities.

One cannot state generally that either one of these movements is superior to the other or in the right direction for optimum agricultural transformation. For one thing the planting of palm trees in the new development near Madina shows a certain degree of locational adjustment. This would appear to be a promisingly good trend because these new areas are supplying the main towns with fresh agricultural products and compensating for the destruction of palm-trees, which has taken place in the course of Madina's urban expansion. Despite these advantages, however, it is difficult to ignore the fact that removal

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of most of Madina's forest involves an eventual threat to land fertility, because this forest is located at the intersection of Wadi Al-Hamdh and cross-valley streams. Expansion of cultivated areas at the expense of this forest could invite possible soil erosion. For this reason certain new developments may bring with them the danger of locational maladjustment.

In the processes of transforming traditional agriculture one can hardly fail to observe the diversity of locational adjustment, a fact which tends to make any appraisal subject to exceptions and reservations. The creation of new villages, as previously mentioned¹⁷ and the conversion of formerly unpopulated areas into areas of active cultivation are examples of actual transformation through locational adjustment. For example, Solsolah and Al-Haferah are undergoing radical change in terms of their locational positions. Until the 1960s they were unpopulated areas, possessing no economic merit except as caravan stations. Conversion of these and similar locations into viable economic bases is certainly facilitating capital mobility and accelerating agricultural transformation in Western Saudi Arabia.

17. Supra, Ch. 2, pp. 35 - 36.

CHAPTER FOUR

Ibn Khaldoun's Geographic Model and View of Traditional Co-operation

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4. Ibn Khaldoun Geographical Model and Traditional Co-operation

Introduction

Traditional co-operation is considered in this study as a fourth factor of production. Moreover, although traditional co-operation may seem out-dated in terms of agricultural techniques, its application to Western Saudi Arabia may still be beneficial in modernising agriculture.

In this context, Chapter four draws on the Khaldounian contribution, in particular his geographical model and his ideas of traditional co-operation.

Although mention of Ibn Khaldoun has been made in reference to asabiyya and Arab traditional co-operation both of these concepts cannot be appreciated fully without further reference to the work of Ibn Khaldoun.

The introduction of Ibn Khaldoun may provoke the question as to whether or not his work is relevant to contemporary problems of agricultural development in Western Saudi Arabia. This matter is dealt with as follows:

Section 1 is a biographic sketch of Ibn Khaldoun;

Section 2 is a brief outline of his works;

Section 3 introduces the concept of the model as well as its relevance to agricultural development;

Section 4 is on the Khaldounian model of traditional co-operation and agricultural surplus; and

Section 5 examines the limitations and potentialities of the Khaldounian ideas.

4.1 Ibn Khaldoun (1332-1406) - Biographic Sketch

Ibn Khaldoun was born in 1332 at Tunis. He himself traced his roots back to his tenth grandfather, a descendant of a south Arabian tribe.¹ His father and grandfather were prominent in administrative posts and were involved in politics, yet both retired to conduct academic and scholarly works. He grew up in an aristocratic family and an academic milieu which constitute favourable conditions for a productive intellectual life.² Yet neither his ambitions nor the political influences of his time were on his side. He was determined to occupy the highest rank of political leadership. In fact he achieved some of his objectives, but not without paying a high price. He was active in external political affairs, including the posts of diplomat, envoy and ambassador.

In 1364 he was entrusted with a diplomatic mission to Pedro el Cruel, King of Castile and Leon, to conclude a peace treaty with the ruler of Spain.³ Furthermore, he was patronised by the rulers of Tunis, and for them, acted as Chief Qadhi, while at the same time conducting his own research. After a few years,

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1. Omer Farrokh, Treaty on Ibn Khaldoun and his Introductory Book, trans., (Beirut, Istiqlal Publishers, 1950), pp. 18-22.
 2. Muhsin Mahdi, Ibn Khaldoun Philosophy of History, (Chicago: University of Chicago Press, 1964), pp 20-28.
 3. Charles Issawi, An Arab Philosopher of History, Selections from the Prolegomena of Ibn Khaldoun of Tunis (1332-1406), (London: John Murray:, 1969), p. 3.

however, he was suspected of plotting against the ruler and was imprisoned on political grounds. He resumed his research and writing activities after his release, but due to his entanglement in politics he was the target of oppression and harassment. In 1382 he left for Cairo and remained there until he died in 1406. During his stay in Egypt he taught at Al-Azhar and other schools, and was appointed "Grand Qadhi" six times.

Ibn Khaldoun was trained in two major fields. The first of these was Religion and Tradition, i.e., Koran, Hadith, Jurisprudence and Mysticism, which were supported by the study of the Arabic language including Arabic literature and rhetoric. He seems to have mastered this field in addition to his training in writing official reports and correspondence. The second field, that of philosophical discipline, was also major and includes mathematics, metaphysics and politics.⁴

4.2. Ibn Khaldoun's Works

Ibn Khaldoun's contribution to thinking lies in his Universal History which contains various disciplines, i.e., geography; sociology; and economics. He divided his works into three large parts which in turn are organised into seven volumes.

In the first volume he investigated, at great length, the cultural processes underlying the progress

4. Walter Fischel, Ibn Khaldoun in Egypt, His Public Function and his Historical Research: An Essay in Islamic Historiography, (Berkeley: University of California Press, 1967), pp 30-45.

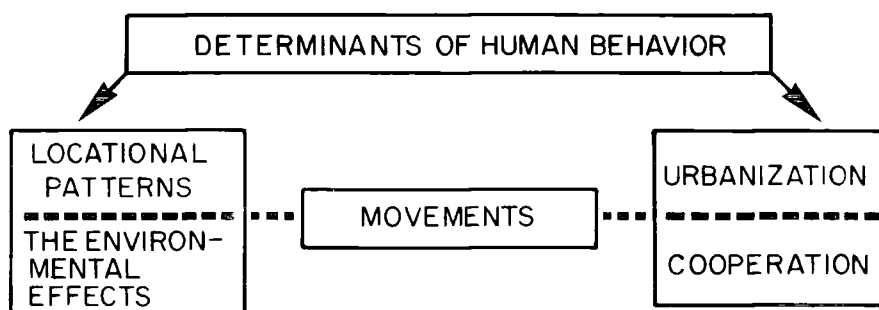
of society in general and the Arabian bedouin in particular. The causes and means of achieving agricultural surplus were examined by him in great detail. The second part, which includes volumes II to V, is an historical account of the pre-Islamic Arabs, the Babylonians, the Copts, the Israelites, the Jews, the Christians, the Persians, the Greeks, the Romans as well as the History of Islam. The third part, which corresponds to volumes VI to VII is historical analysis dealing with the Berbers.

Compared with his contributions to sociology and history, Ibn Khaldoun's geographic methodology does not seem fully appreciated. His name is rarely mentioned among his Arab contemporaries, for three reasons: The first reason lies in his unfortunate timing in history, for during his lifetime Islamic civilisation was undergoing rapid disintegration. The discouragement of intellectual activities was common. Nevertheless, it seems that his geographic approach tends to deviate from his contemporaries who used to reproduce the pre-existing geographic knowledge of Greeks without serious attempt at innovation. The second reason is that, by the time Western scholars discovered his works, geographic knowledge already made rapid progress. Therefore it was too late for his works in the field of geography to be incorporated into the main stream of geographic thought. The third reason, and perhaps the most important one, stems from the very novelty of his contribution, for like any new ideas, his departure from certain traditional methods of writings was not immediately grasped and thus

the innovation of his contribution was overlooked.

One cannot overemphasise how much Ibn Khaldoun's geographic contribution has been neglected. Although the Arab geographers appreciated travellers' accounts and descriptions of foreign places, they nevertheless found it difficult to accept the new methods of geographic analysis. This is not to claim that Ibn Khaldoun achieved a radical departure from the traditional way of writing geography, but rather to stress the fact that his contribution to geography lies in his new approach. For example, by maintaining that bedouin characteristics are traceable directly or indirectly to environmental factors such as location, climate, food and occupation, the present author feels that he is one of the founders of what can be called "environmental geography", or more aptly "behavioural geography". This can be diagrammatically presented in Fig. 4.1. as follows.

Fig 4 | THE KHALDOUNIAN BEHAVIORAL
GEOGRAPHY



4.3. Relevance of the Khaldounian Model to Agricultural Development

According to the Khaldounian model, there are certain phenomena underlying agricultural change. Before examining such factors the term "model" needs to be defined. For the purpose of this study, "model" is confined to a system of relationships between various variables, such as factors of production (land, labour, capital and traditional co-operation). Moreover, in this study the model has been used to show the working (causal) relationships that operate between active variables affecting traditional agriculture in Western Saudi Arabia. It is therefore useful not only for diagnostic and illustrative purposes but also for practical implementation. For these reasons, a distinction should be made between the scope of the model on the one hand, and the time factors on the other. The former explains some trends affecting traditional agriculture, such as hijra, bedouin migration, and specialisation. The latter may suggest the choice of techniques in short-term and long-term perspectives which can accelerate the processes of transformation. For example, the government may encourage traditional co-operation in Western Saudi Arabia in addition to the settlement programmes in other locations.

Choosing Ibn Khaldoun's model by no means implies its superiority over the most recent models. The choice of the author stems from two main reasons. First, the Khaldounian model is mostly derived from Arab culture and environment. For instance, he related certain waves of

bedouin migration to the type of land patterns in Hijaz. Second, it seems to the present writer that his model, though as any model not perfect, is a reflection of Western Arabian reality because not only did he relate Islamic culture to its particular environment, but also discovered a connection between cultural processes and agricultural surplus in the Arabian context.

4.3.1. Aspects of Scientific Method

To some students of agricultural development it seems inaccurate to describe Ibn Khaldoun's model as a 'scientific' one. This is because the word 'scientific' appears to have various meanings and to imply differing concepts in different societies.⁵ Ibn Khaldoun's approach to be considered scientific depends on what are (or what are regarded to be) the distinguishing features of science.⁶ To some a science is characterised by precision and vigorous methods of analysis, whereas to others science is perceived through the certainty of results. The "Green Revolution" in South East Asia is an example of this perception where scientific results are taken as proper criteria to judge scientific methods.⁷ Another aspect of the issue suggests that 'scientific' means a set or series of empirical propositions which will yield a high degree of certainty in their outcome.

5. R.S. Silver, "The Misuses of Science", New Scientist. (5th June, 1975), pp. 556-557.

6. Russel Keat and John Urry, Social Theory as a Science, (London: Routledge & Kegan Paul, 1975), pp. 9-22.

7. Yujiro Hayami and Vernon Ruttan, Agricultural Development, An International Perspective, (Baltimore & London: John Hopkins Press, 1971), pp. 215-218.

For the purpose of this study the word 'scientific' is confined to systematic analytical methods as implied in Ibn Khaldoun's geographical approach, in which he relates a variety of themes, theories and ideas to one single problem, i.e., the relationship between man and the earth. Furthermore, he shows how the Arabian socio-economic processes involve the improvement of agricultural techniques. By so doing Ibn Khaldoun satisfies two basic elements of science, i.e., explanation and prediction.

4.3.2. Practical Problems

Another source of relevancy of Ibn Khaldoun's model lies in his approach to dealing with socio-economic problems facing Arab communities in the desert, urban life, and future organisational systems. Though he deals with problems of his own time, he touches upon comparable human problems at the present day, with powerful analytical methods and remarkable imagination.

In maintaining that agricultural development is an organic whole underlying human civilisation, Ibn Khaldoun was far ahead of his time. To appreciate what this means one should compare the problems of Arab settlement and urbanisation as envisaged by Ibn Khaldoun with modern-day settlement programmes in the Arab world in general and Saudi Arabia in particular. The assertion that Ibn Khaldoun's views are dead issues is erroneous. Recent scholars have shown great interest in the ideas of Ibn Khaldoun. In 1962 the Arab League organised a special conference on Ibn Khaldoun. Some participants

at the conference endorsed the validity of Ibn Khaldoun's model for Arab social programmes, while others urged further study of his writings.⁸

Furthermore, Ibn Khaldoun's model seems to gain ground with time. Charles Issawi summed up the nature of Ibn Khaldoun's model as follows:

More than any one of his contemporaries, whether European or Arab, he tackles the kind of problems which preoccupies up today: the nature of society; the influence of climate and occupation on the character of groups; the best educational methods, etc.⁹

Such problems and other related issues have been examined at great length by E.A. Gellner, who points out that Ibn Khaldoun's model is not only applicable in the past time but is also valid in certain developing societies today. The central theme is the sort of consciousness developing within the Islamic society and the responsible authority which facilitates the Islamic institutions to adapt themselves to the changing economic and social conditions.¹⁰

4.3.3. Strategic Factors

The movement towards settlement programmes in Saudi Arabia and in the Arab World concern not only agricultural projects but also social development

8. Makki Al-Jamil, *Al-Badawah Wa Al-Badu Fi Al-Bilad Al-Arabiyya Wa Wasael Tawtinahom*, trans. The Bedouins in the Arab Countries and the means of their Settlement (Cairo: Center of Arab Community Development, 1962), pp 20-30.

9. Charles Issai, op.cit., p. 2.

10. E.A. Gellner, "Ethnic Consciousness Within Western Islam" (4th July, 1977). Guest Speaker for British Society for Middle Eastern Studies, Fourth Annual Conference held at St. John's College, Oxford.

planning. For, as the state assumes responsibilities and authority over both sedentary and bedouin affairs, settlements become national problems partly because the state is dealing with changing society and partly because development planning involves long-term programmes. Furthermore, no agricultural project can be expected to succeed without taking bedouin problems into consideration. As one Arab League expert put it "settlement is not a mere transferring of people from one place to another, it is a process of human and resources development on the national level".¹¹

A review of agricultural development programmes reveals two major difficulties. One is that of facilitating change to a better organisation in order to strengthen specialisation; another is that of transforming traditional agriculture, which depends as much, if not more, on cultural and social aspects than on technical aspects. It is vitally important, therefore, to appreciate social norms and traditional values in such a way that transitional strategy proceeds gradually and smoothly.

It seems to the author that Ibn Khaldoun is one of the classical Arab scholars who laid the foundations for a clear understanding of Arab culture. Moreover, the implications of his social programmes for achieving "agricultural surplus" seem consistent with present-day strategy for economic development.

4.3.4. The Message of History

Ibn Khaldoun is a product of his time, so in one sense, his methods of analysis and his conclusions regarding socio-economic processes are no longer applicable. His schema represent the past political and social organisation of the Arab "bedouin civilisation". In another sense, however, both Ibn Khaldoun's model and his message will last indefinitely in the Arab world. He is one of those who believe that the message of history may best be understood in terms of the geographical study of earth and man. His economic sociology can provide planners, who are seeking lessons from history, with a powerful tool to evaluate historical records of their societies, and to judge their future prospects. His model contains historical facts of the bedouin development, cultural traits and effects of environment on national temperament and traditional co-operation.

4,4, The Khaldounian Model of Traditional Co-operation and Agricultural Surplus

According to Ibn Khaldoun, agricultural surplus can be achieved by effective organisation of human relations and labour; the former tends to be enhanced by the human propensity to co-operate whereas the latter can be developed through occupational specialisation.

Yet, his theory can hardly be appreciated without taking into account his geographical model and traditional co-operation. Fig. 4.2. shows how an agricultural surplus may be attained.¹²

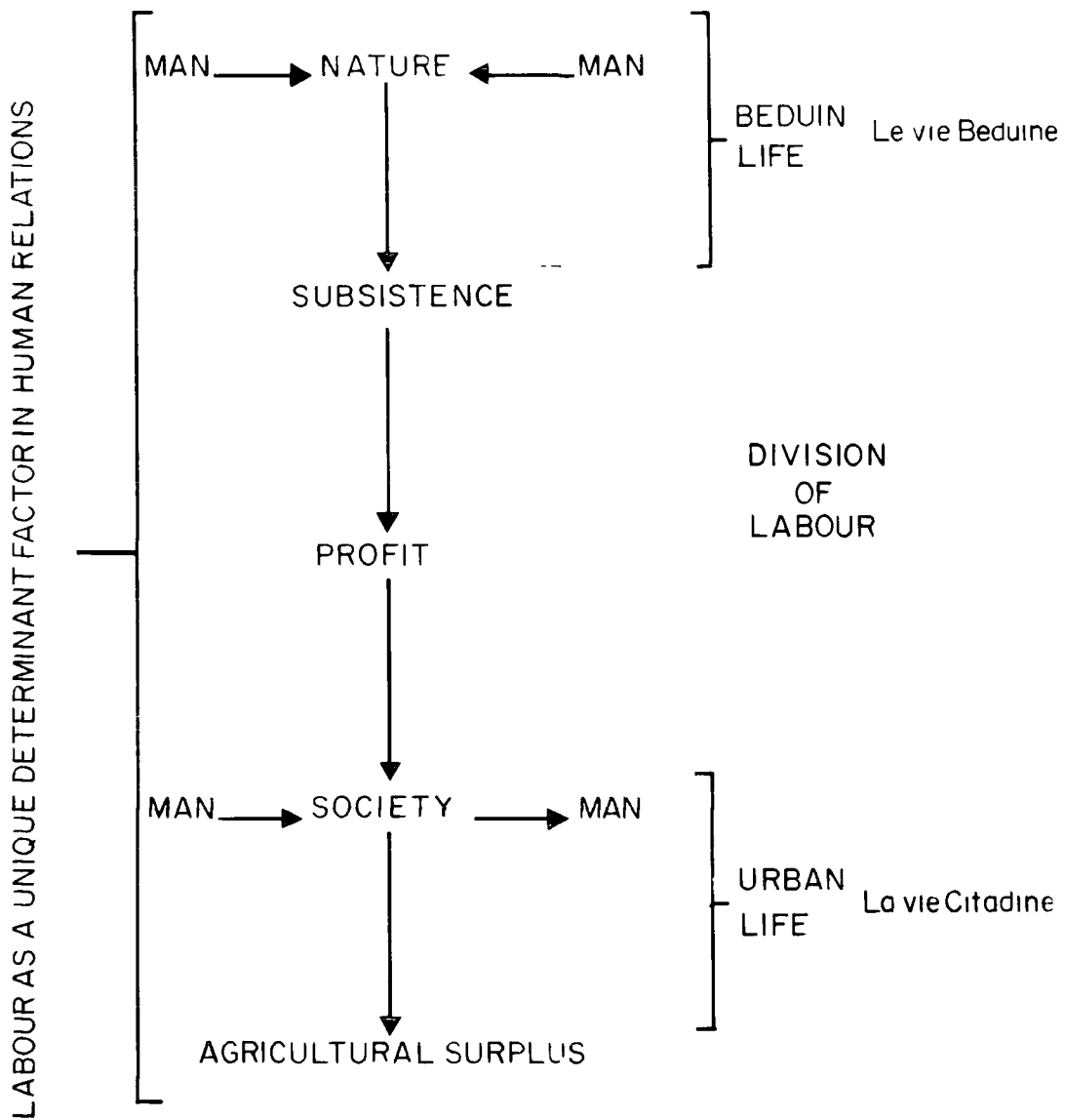
4.4.1. The First Phase

According to Ibn Khaldoun, in most of the mid-latitude or temperate zones there are favourable conditions for the production of grain, wheat and fruit. This is the main reason, in his view, for development of civilisation in such regions which are in sharp contrast to some areas in the Hijaz and the Yemen, where the Arabs roam the arid desert regions. Their subsistence economy is based on dates and milk. The inhabitants of such places as Hijaz, the bedouin, where harra (lava): unproductive land, constitutes a great deal of the desert neither enjoy the pasture nor lead a comfortable life.¹³

12. M.L. Benhassine, "La Pensée Economique D'Ibn Khaldoun" Société Histoire Algerienne, Revue D'histoire et de Civilisation du Maghreb, No. 13 (1976 Janvier, 1976) p.66.

13. Ibid, p.62.

Fig 42 AGRICULTURAL SURPLUS



Source M L Benhassine "La Pensée Économique D Iban Khaldoun", Revue D'histoire et de Civilisation Du Maghreb No 13 (Jan 1976)

In a lengthy discussion he concluded that the hard life of the bedouin had created in them certain characteristics, including healthier bodies and more creative minds than townsmen, due mainly to their frugal but more wholesome diet. Social organisation and the level of their co-operation hardly exceed their bare subsistence level. He indicated that co-operation will lead to far reaching economic and social consequences.

In fact the word 'co-operation' (taāwun) is a somewhat unfortunate word which has contributed to confusion and misinterpretation. In discussions of the early, primitive life of the bedouin civilisation Ibn Khaldoun used the word 'co-operation' to mean nothing more than "to work together"; in other instances he utilized the word 'co-operate' in a different sense, the tendency "to integrate harmoniously the heterogeneous tribal system in various parts of Arabia". The third and probably the most vital meaning he gave to the word was the division of labour', which, in his model, marks the final phase of Arab civilisation.

4.4.2. The Second Phase

Once the social organisation and co-operation (division of labour) of the bedouin have taken them beyond their subsistence economy the sedentary phase emerged. Ibn Khaldoun's reasoning is straightforward and reasonably clear. The subsequent improvement of the bedouins' conditions could be escalated only if they achieved an agricultural surplus. The relationship, therefore, between

the bedouin organisation and the natural resources became clear when the bedouins shifted from the bare necessities of life to acquisition of more wealth and what he termed the 'comfort of life'. But since human aspirations are unlikely to stand still, and the bedouins are no exception, such a pattern of improved life will stir further human wants. Thus the formation of 'highly developed luxury' marks a new phase of the 'Bedouin Civilisation'. He emphasised that the formative phase for luxury life can only attain by the means of full co-operation (division of labour).

Full co-operation, Ibn Khaldoun maintained, leads to tamaddun or what is now called urbanisation. Furthermore, he recognised that this phase is a complicated social process, not only in the bedouin case but in all human history. In this phase, Ibn Khaldoun argued that the bedouins remain nomadic people and their motivations are still rooted in the desert life.¹⁴

4.4.3. The Third Phase

Umran is the key issue of this phase. Rightly, both Bousquet¹⁵ and Rosenthal¹⁶ have interpreted this word to mean 'development'. Ibn Khaldoun has carried his previous argument further: that it is necessary for man

14. Franz Rosenthal, Ibn Khaldoun An Introduction to History, THE MUQADDIMAH, (London: Routledge and Kegan Paul, 1967), pp. 99-102.

15. G.H. Bousquet, Les Sociologiques et Economiques de La Moqaddimah, (Paris: Librairie Macel Riviere et Cie, 1965), pp. 148-154.

16. Franz Rosenthal, op. cit., pp. X-XI.

to co-operate with his fellow men. In this stage of mutual co-operation the tribal system has weakened further and new social organisation grows in size and in function and this signifies a real development in civilisation. Ibn Kahldoun concluded that when the bedouin transformation reached this stage, an attainment of agricultural surplus and more developed civilisation would be approached. Furthermore, this is the highest stage of sedentary life where the hard life of the desert is replaced by the easier one of town life. This cultural form represents the foundation of a sophisticated and powerful state which necessitates a higher degree of Asabiyya co-operation.

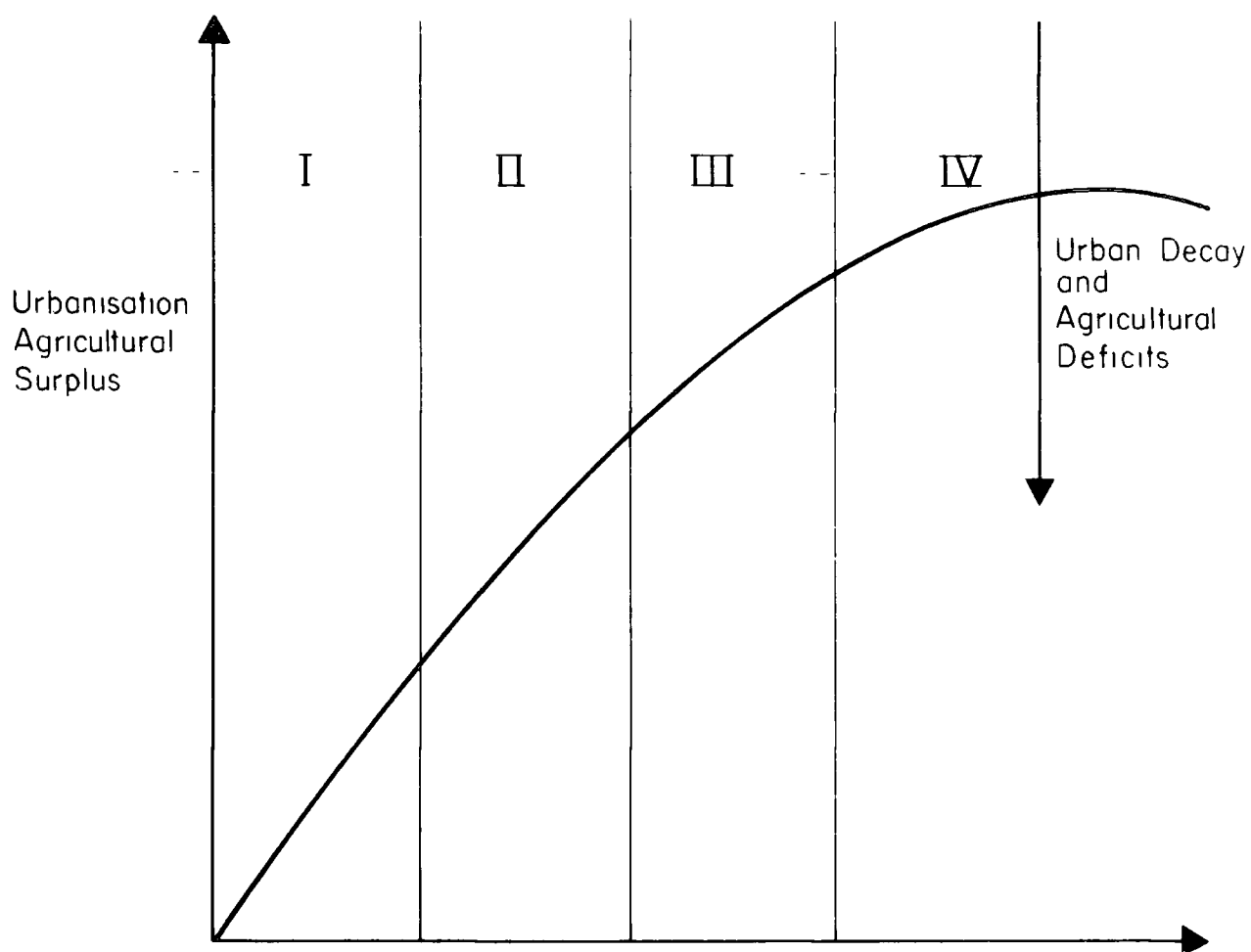
4.4.4. The Fourth Phase

This stage emerges immediately after the third bedouin generation loses its natural characteristics. The main causes lie in the fact that the submergence of the bedouin in this new life of prosperity and the drastic shift from necessities to luxuries tend to weaken the sense of community and to destroy their courage and solidarity. This leads to the neglect of agriculture and consequent diminishing food supplies.

Moreover, Ibn Khaldoun maintained that between the third and the fourth stages the state reaches the height of its maturity. So, after the third bedouin generation the state approaches its 'natural death'. Thus Ibn Khaldoun's theory started with the simple bedouin life, yet it sadly concluded that such civilisation might well end in human tragedy.

The previous Figure 4.2. introduced by Benhassine confines itself to Ibn Khaldoun's political economy and the processes by which agricultural surplus can be attained. The following Figure 4.3. shows association between the progress of human civilisation and agricultural surplus in the Arabian context.

Fig4 3 THE STAGES OF THE BEDUIN CIVILISATION



- I The natural phases of Beduin civilisation subsistence economy
- II The formative phase of traditional cooperation division of labour
- III The sedentary phase urbanisation and optimal agricultural surplus
- IV The 'natural death' of the state

4.5. Limitations and Potentialities of Ibn Khaldoun's Model

Full justice cannot be rendered to Ibn Khaldoun because the previous summary of his geographical model has concentrated on ideas which seem relevant to this study. His unequalled mastery of sociological analysis and an actual understanding of bedouin socio-economic conditions enabled him to develop a promising model for both settlement programmes and eventual agricultural transformation. To appraise Ibn Khaldoun's model four related issues need to be investigated: geographic determinism; theoretical structure; empirical studies; and modernisation problems.

4.5.1. Geographical Determinism

Beneath the broad approach of Ibn Khaldoun's model lies both weakness and strength. One criticism is exemplified by the progress of agriculture in Australia and other Asian tropical areas which argue against his geographic physical determinism. Climate would seem not seriously to affect human behaviour as is implied by Ibn Khaldoun. As a report of The Australian Health Department concluded:

In tropical Australia...there is practically no circumstances which can be laid hold of as representing a definite disability to the white race other than those faulty circumstances of social environment which are inseparable from the opening up of a new country for the purpose of primary production. First-generation, second-generation, and third-generation Queenslanders are performing their life work and following their ordinary avocations as they could in the temperate

climates, and there is at the present no indication that the strain of tropical life is an actual one, or that the outlook of these people is anything but hopeful.¹⁷

On the positive side, however, nearly all less developed countries are either too hot or too cold. Furthermore, agricultural productivity and livestock production are relatively low.

Lee seems to share Ibn Khaldoun's views regarding geographical determinism:

Tropical lands suffer from the drawback of being divided into three sections completely separate by broad oceans. Between them, and even between tropical Asia and equatorial Africa, cultural relations have been very difficult and consequently very slight. These conditions were not very favourable to the progress of civilisation. On the other, the temperate lands of Europe, Asia, and Africa as a whole offered by their cohesion far greater possibilities of cultural exchange and mutual fertilization of ideas.¹⁸

4.5.2. Theoretical Structure

Despite Ibn Khaldoun's literary skill and clarity of thought, the diversity of fundamental social issues, the mechanism of cultural processes and the question of human co-operation have made his theoretical analysis difficult to appreciate. Therefore, three following points are worth brief mention.

(A) Diversity of Themes

His main model emphasises the relationship between man and his environment as revealed in the play of forces of political and social organisation. According to him, social phenomena tend to follow certain sequences of events.

17. Quoted by Douglas H. Lee, Climate and Economic Development in the Tropics (New York: Norton Co., 1957), p. 9.

18. Ibid. p. 141.

And because such events are a natural expression of social organisation they tend to follow a cyclical pattern. Thus the general trends of social changes are predictable.

Again, he maintained that the "mid-latitude" areas of the earth, lying between its polar and equatorial extremes, possess the best conditions for man. Thus, from the relationship between man and his environment he developed his theory of Asabiyya.

This is the theory from which he derived his conclusions of social organisation in general and the Arabian bedouins in particular. The relevance of this theory to bedouin development and agricultural transformation is not hard to understand but difficulties lie in the general structure of theory itself. His encyclopedic style, analytical performance and method of exposition have contributed to some confusion.

Firstly, there are the socio-economic phenomena. In his work we find not a single theory but several. He developed a theory in sociology, a theory of history, a theory of geography, and a theory for political economy. Due to recent developments in the various disciplines, in addition to the sharp specialisation where by boundaries between various disciplines tend to create artificial gaps between the approaches of different social scientist, Ibn Khaldoun's theories have been divided and subdivided among scholars. Economists showed less interest in the practical implication of

Ibn Khaldoun's socio-economic views on the grounds that contemporary economic theory had already reached a stage of perfection. Sociologists held similar attitudes. In brief, the division between scholars is not confined to the areas of theory but spreads into the fields of practice and policy. Instances appeared clearly in the contemporary approaches towards bedouin development.

(B) Mechanism of Cultural Processes

Ibn Khaldoun's theoretical structure does not tolerate partial analysis. This is because the mechanism of the social process possesses an organic nature, so the various phases of social development appear in various forms. For example when he developed the model of bedouin civilisation he linked the way of life to the process of social organisation: for instance, animal husbandry, cultivation of vegetables and grains and eventually construction of towns. Each of these human activities appears either as a phase or as a part of the mechanism of social organisation.

The Asabiyya concept, has been largely either misunderstood or else underestimated despite the vital importance of such a concept as a key to bedouin settlement and agricultural development. Franz Rosenthal in his excellent translation of Ibn Khaldoun's Muqaddimah ("Prolegomena", or Introduction) has interpreted the word Asabiyya as closely as possible to its actual significance. He listed three meanings, thus: (1) solidarity, (2) group feelings, and (3) group consciousness.¹⁹ They

19. Franz Rosenthal, Ibn Khaldoun An Introduction to History, The Muqaddimah, p. xi.

approximate closely in meaning and it is doubtful whether any linguist could better his attempt. In fact, a single exact meaning can probably not be found. That is to say, every language has its own system, and when the present meaning becomes too rigid it is possible that an alternative meaning should be looked for.

Indeed, both the meaning of this word and its concept were in one sense already dead before Ibn Khaldoun's time, yet in another sense its implications still exist today and they will do so for time to come. Ibn Khaldoun borrowed Asabiyya from Islamic literature which contains Asabiyya in various forms throughout Arabian history. For instance before Islam Asabiyya was condemned whereas after Islam arrived Asabiyya became highly praised. Of course both concepts are associated with the functions of Islamic state. Yet in the transitional society of Saudi Arabia, which is determined to maintain its traditional culture while at the same time adopting modernisation, Asabiyya has lost most of its meaning to become an integral part of the national goals. These goals include social development and agricultural transformation.

(C) Development of Human Co-operation

The theoretical structure of Ibn Khaldoun seems to be affected by his serious endeavour to explain the way in which traditional co-operation changes over time. So, Asabiyya has been introduced by him to signify various degrees of human co-operation, i.e, blood ties; traditional ties; economic motivations; and values and norms.

Though the author agrees with Ibn Khaldoun, Asabiyya may be defined as: a state of consciousness and general orientation for mutual co-operation. The success of bedouin settlement initiated by King Abdulaziz under the hijra Programmes, which are probably unequalled in any settlement in the Arab world, is based on full grasp of the implications of Asabiyya. Asabiyya involves the effect of the socio-economic structure transforming traditional agriculture at the tribal level, Since the bedouin tribal system tends to maintain itself in isolation of a modern state.

The cultural traits of the bedouin and the sort of co-operation which cuts through the socio-economic structure are difficult factors to reconcile in Ibn Khaldoun's theoretical structure. Ibn Khaldoun did not attempt to define the bedouin, yet he developed admirable criteria not only to distinguish the bedouin from the sedentary but also to understand their basic motivation. His criteria involved the way of life as reflected in bedouin economic and social activities. He maintained that the bedouin who live by animal husbandry, sheep, goats and camel, are economically attached to the desert, though this is a matter of degree since the animal requirements of pasturage are not the same. The bedouin who herd sheep and cattle have little range of travel and they dare not go deep into the desert. On the other hand, nomads herding camel have a greater freedom of movement which has encouraged them to penetrate into more remote regions. He concluded that the hard

life of the desert and the mobility of camel between them created the natural phase of bedouin civilisation. Why is it a natural phase? Because both the vision and the insight of Ibn Khaldoun were conditioned by the cultural stage in which he was living. He considered the bedouins as a natural group in the world.²⁰ Today, however, all the Arab states, and probably all the industrial nations too, look at the bedouins as a special pattern of life, an unhappy one which represents the pre-history of man. What Ibn Khaldoun really meant is that people are distinguished by the different styles of life which might be viewed as types. The style of life in the desert has in a natural way forced a living to be made in the form of agriculture and husbandry. Furthermore, Ibn Khaldoun insisted that as long as such bare necessities of life dominate the lives of the bedouin, they are still in the natural phase.

4.5.3. Empirical Studies

The F.A.O., the World Bank and the Saudi Arabian Government have documented the problems of labour shortage, which is critical to the entire economy. As the Economist put it:

"the foreigners make up the greater part of the national labour force and also provide and man the service ... a national with any education beyond the primary level expects employment in government services ... the administration machines have become more as a means of providing employment for semi-educated and illiterate nationals than for efficient administration of the State."²¹

20. Abdulrahman Ibn Khaldoun, Muqaddimat Ibn Khaldoun, (Baghdad: Al-Muthanna Publisher, n.d.), pp. 120-122.

21. Michael Wall, "Saudi Arabia Giant Among the Dwarfs" The Economist, 235 (6th June, 1970), p. XV.

The goals of the bedouins' development are aimed at a maximum possible development of skills and the capacities of the Saudi labour force.

Unfortunately, despite the efforts of the government to mitigate the dependence on foreign labour it seems that the shortage of the Saudi labour supply will continue for several decades to come, which must be compensated for from abroad. That, however, depends on international relationships and the degree of political stability of neighbouring countries. The reasons for such labour shortage is not hard to understand. Certain social phenomena such as labour attitudes towards work have already been pointed out. In fact the tendency of the bedouin's dislike of certain types of work is the main reason that several thousands of Yemenis have found job opportunities in Saudi Arabia. Shortage of labour to the Saudis' attitudes towards work or "cultural bias" which have been examined in this thesis.²² In fact, Ibn Khaldoun's "Asabiyya" theory, which he has neatly applied to the Arabian bedouin, is very close to the author's "cultural bias" concept. In this connection, the migration pattern of the bedouin has been developed to explain the causes of their problems.

4.5.4. Modernisation Problems

Many studies of modernisation suggest that agricultural transformation tends to be followed by urban

22. Supra, pp. 58.

development. Moreover, bedouin and rural settlements have been advocated not only in Western Saudi Arabia but also in other Middle Eastern countries.²³

One advantage of these studies over Ibn Khaldoun's model is that the presentation of the factual data is quantitative in nature, although still descriptive and aimed at practical solutions. it is fair to say that it is not the purpose of these practical studies to produce theoretical frameworks of past and present problems. But any attempted solution is doomed to failure unless the link between the beoduin past, present and future is visualized in its proper perspective. This is where Ibn Khaldoun's model gains its relevancy. He developed his model on the basis of the causes of events behind the various phases. For example, in the three phases he successfully related both the bedouin attitudes and behaviour to his Asabiyya as a motivating force.

Obviously, all these studies are intended to discover the facts about the bedouin, yet Ibn Khaldoun constantly emphasised that such facts in themselves require interpretation. In other words, in order to discover a pattern in the changes that sequentially occur in bedouin life it is insufficient to study the tamaddun (urbanisation) and the government which represent the highest form of social organisation. What is needed therefore is to analyse the physical environment of the bedouin, and their changing social and economic life either by observing changes in the life span of a generation or by analysing each phase and the transition between phases. Tamaddun

23. Daniel Lerner, The Passing of Traditional Society: Modernising the Middle East, (N.Y. The Free Press: 1968) pp.65-68.

problems which faced Ibn Khaldoun are facing our contemporary economists. The economists, with no exception as far as is known, agree with Ibn Khaldoun that Saudi Arabia, prior to and during oil discovery, was a pre-industrialized, pre-mechanized, and more important a pre-agricultural economy. However, Ibn Khaldoun unlike most of them considered tamaddun as one of the highest phases of the bedouin civilisation and that it signifies real social progress, whereas present economists are frightened by the desert "depopulation". Of course, economists and demographers are talking about urbanisation in general; yet the fact remains that urbanisation in developing countries is less than advanced countries (the ratio of city population to total population). Furthermore, the experience of the first industrial nation (U.K.) suggests undisputably a clear positive correlation between degree of industrialisation and degree of urbanisation.

Recently, however, new trends of thought are strikingly consistent with Ibn Khaldoun's model. Kingsley Davis found that the correlation between urbanisation and industrialisation in the pre-industrial areas was +0.86, which is very high.²⁴ These trends, like Ibn Khaldoun's model reject the widely held views that urbanisation represents a disastrous phenomenon, a view which advocates that the depopulation of the countryside must be stopped. Undoubtedly, urbanisation is a problem, yet any attempt

24. Kingsley Davis, "Urbanisation and Development of Pre-Industrial Areas" Economic Development and Cultural Change, 3 (1954-55), pp. 6-24.

to stop urbanisation will not only delay social progress, at least in Saudi Arabia, but will also contradict the function of the modern State. This is because the structure of the bedouin economy and their tribal system are not consistent with the modernisation process. As things stand, most of the bedouin economy, outside the main cities, will be unable to produce an agricultural surplus. This is what prevents agricultural transformation. Agricultural surplus is a decisive factor in the bedouin system because the degrees of division of labour, the size of property, inheritance, crafts and manufacturing development, the extent of exchanges, and finally the fully monetized economy cannot develop unless the bedouin adopt a sedentary life. But how can favourable conditions for sedentary life be created? Ibn Khaldoun insisted that "the bedouins are a natural group in the world, the desert is the basis and reservoir of civilisation and cities".²⁵ Furthermore, he emphasised that urbanisation is the goal to which the bedouin aspires, mainly motivated by the lure of greater convenience and more luxuries. He maintained, however, that this phase is unlikely to happen unless the growth of towns and cities expand enough to make the development of convenience and luxury possible by channelling sufficient labour into the production and services of commerce art and sciences. In fact his views are unlike the physiocrats²⁶ who have advocated that the prosperity of mankind depends solely on agriculture, and labour is

25. I. Khaldoun, op. cit., pp. 122-124.

26. Bert F. Hoselitz, "Agrarian Capitalism, The Natural Order of Things : François Qunsay", Kyklos XXI (1968), pp. 637-663.

productive only when applied to land. Thus, the professions such as philosophers and artists are "sterile" classes.²⁷ On the contrary, under his concept of ta'awun Ibn Khaldoun viewed human resources as the main "wealth of nations".

4.5.5. Typical Farming System in Western Saudi Arabia

While traditional agriculture in Western Saudi Arabia, as this study has attempted to show, is undergoing structural change, the old farming system has not completely vanished.

The present author, while conducting field work in Western Saudi Arabia, noticed that although agricultural change has touched almost every area, the marks of the old farming system are still visible in many areas and indeed in certain locations it still represents the normal practice.

Investigation of three typical locations in Western Saudi Arabia may throw some light on the potentialities of Ibn Khaldoun's ideas in two ways, i.e., traditional co-operation and its effects on the locational pattern.

(A) Wadi Al-Hamdh:

The farming system in this area is based on the asabiyya concept which governs location of farms and the underlying traditional co-operation among farmers. This wadi, which from the proximity of Taif, descends toward

27. B.F. Hoselitz, Ibid.

Agaba and passes through Madina, is a good grazing area and contains fertile land with sufficient water.

Past disputes among the various tribes surrounding this wadi have led to an arbitrary division which has put an end to tribal conflicts. So, the wadi has been divided into a western and an eastern side with an imaginary demarcation line passing along the middle of the wadi. As a consequence the various plots along both sides of the wadi are governed by tribal ownership, and within each tribal plot private ownership subdivides the land further. Al-Mulaileeh village is a classical example of this sort of arrangement which has given rise to two sources of private ownership. One is the original division among the members of each tribe; the other is by means of subsequent buying and selling.

The division of Al-Mulaileeh village follows the demarcation line halving the wadi, one half for the Juhaina tribe and the other for the Harb tribe. This arrangement is still in force at the present time. Though any member of either tribe can sell to or buy from any other individual, effective traditional co-operation in the areas of well digging, fencing, cultivation and harvesting is guaranteed only among the members of each tribe. Moreover, traditional co-operation is extended to members who have migrated to the major towns of Hijaz. Absent members therefore can feel that their farms will not be neglected during their absence.

Voluntary co-operation of this type is based on mutual co-operation and traditional norms which cannot

be measured in terms of immediate money return. No planner can ignore the possibilities of encouraging traditional co-operation that represents a practical incentive for improving traditional farms. The present author who has had the chance to discuss and observe the motives behind this voluntary co-operation among tribes of Western Saudi Arabia is inclined to appreciate the Khaldounian ideas of this type of mutual co-operation.

(B) Khayber

Khayber is another classic example of community ownership. Its farming system is a mixture of share cropping and rental arrangements. The whole village is owned by the Anaza tribe, yet cultivation, irrigation and harvesting are left to the permanent settlers who are alleged to be the descendants of slaves.

Selling and buying are prohibited because it is a waqf property. Improvements, repairs and maintenance rest in the hands of tribe members. The tribe members who stay for only a limited period at harvest come to agreements with the permanent settlers on such matters. Traditional co-operation tends to be confined to qunayyat (qanat) maintenance - clearing and drainage and harvesting services.

So, as long as the tribe exists this type of farming system can be expected to persist. This pattern of farming is similar to the Al-Mulaileeh farming system in two respects: one is the traditional co-operation among

the tribe members, the other is the community ownership. Khayber, however, differs in one respect, i.e., it does not suffer an arbitrary division among conflicting parties because its location lies within one tribal district.

(C) Hijaz Mountains

The Hijaz mountains and the plains along the Red Sea are privately owned, yet each plot of privately owned land is located within a specific tribal district. Although the whole area lies within the national territory of Saudi Arabia, the more one moves outside the proximity of the main towns the more tribal concentration dominates the land ownership, with vaguely demarcated lines separating the various locations. This is typical of prevailing conditions in Abha, Yunbu and Al-Figra. Even where certain variations exist, two characteristics are never absent. These are: traditional co-operation, and the divisions designed to demarcate the tribal ownership.

Such co-operation and community ownership are diminishing, and sooner or later they are going to disappear altogether in the main towns of Western Saudi Arabia and their proximities because both the need to co-operate and asabiyya concepts are destroyed by the present trends towards modernisation. Co-operation which was a tribal function now has been institutionalised, i.e., M.A.W. and the Agricultural Bank have overtaken the methods of traditional co-operation.

Despite the eventual disappearance of this type

of traditional farming system the Khaldounian ideas may offer clues to practical solutions. For one thing, the time element, or phases as Ibn Khaldoun calls it, underlies the changing nature of traditional co-operation or even social organisation. No one can advocate the Khaldounian phases for developing traditional agriculture even when the similarities of the traditional Arabian society present themselves today. However, no Arab planner can ignore the average Arabian individual incentive which affects the farming system, the grazing areas and above all the effective traditional co-operation which still exist in Western Saudi Arabia at the present time.

Moreover, although the names of things and concepts have changed, it does not follow that the essence of the problem has radically changed. For instance, the present Saudi Arabian planners envisage agricultural development in time perspectives and they call such time perspectives "demand horizon", meaning that if certain steps are taken to implement agricultural programmes, say five or ten years ahead, then the output targets will be achieved. Strategies aiming at improving traditional agriculture should be implemented gradually according to the time perspectives, though the time periods chosen need neither be a replica of the Khaldounian phases nor exactly the stages the Saudi planners envisage. They should depend instead on the actual progress achieved over each sequential stage. This is one area where Ibn Khaldoun's message may lie. Another area of Khaldounian

insight is that, since tribal ownership can not be easily altered, an alternative should be sought, that is to modify traditional co-operation without destroying the strong incentive underlying it. Other alternatives are hima and co-operative farms which have already been referred to in this study.

P A R T T W O

THE PROCESSES OF AGRICULTURAL TRANSFORMATION
IN WESTERN SAUDI ARABIA

C H A P T E R F I V E

Phase I:

The Hijra as a Point of Departure

Outline of Chapter Five

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5. Phase I: The Hijra as a Point of Departure

Introduction

Against the background described thus far, it is possible to identify the nature of the transformation of Western Saudi Arabian agriculture, which has undergone three transitory phases. The hijra is examined not only as a point of departure but also as a catalyst in the process of transforming traditional agriculture. It marks a new era from the standpoint of national policy which is of a particular interest in any assessment of agricultural modernisation. Thus, the present Saudi Arabian national policy of agricultural modernisation, as we have tried to show, is both an extension and enforcement of trends already introduced by the hijra, and constitutes the Second Phase. Goals and achievements are being elaborated in the Third Phase: the international transfer of technology.

The central theme of this chapter is that traditional agriculture in Saudi Arabia had already undergone transformation prior to the discovery of oil, mainly because of relatively successful community development programmes of hijra. These led to five related developments:

- 1) Replacement of tribal movements by permanent settlement;
- 2) Enhancement of specialisation within traditional agriculture;
- 3) Introduction of technical change through

alterations in occupational structure;

4) A sharpening of Arabian culture to technical change; and

5) A fundamental change in attitudes produced by the reduction of illiteracy.

Section one of this chapter is devoted to the geographical implications of these issues.

Section two examines specialisation within traditional agriculture.

Section three throws some light on the early technical change and occupational structure.

Section four examines the susceptibility of Arabian culture to change, and

Section five treats the impact of improving literacy upon agricultural education.

5.1. Geographic Implications of Hijra

The first attempt to transform traditional agriculture from a predominantly pastoralist mode of production to crop cultivation was initiated by King Ibn Saud in 1912. This was achieved by escalation of what is usually termed hijra. Before we proceed to discuss the ramifications of such developments upon traditional techniques the word hijra needs clarification.

Hijra is usually defined or understood as the abandonment of old areas of settlement. This is indeed correct, but it hardly goes beyond the literal meaning of the word. So, both the consequences and the intention of hijra which underlie its implementation might constitute the basis for definition: The hijra is an organised departure from old areas with the intention of gradually abandoning certain activities. From our definition, therefore, it is clear that the hijra conveys a geographical shift in the form of a new agricultural community: a planned settlement in a fresh location. Surprisingly enough such an historic event, although widely recognised, has rarely been acknowledged to be a turning point in Saudi Arabian agricultural techniques. But why is it a turning point? There are two main reasons:

- 1) The economic routine of traditional agriculture was disturbed and the allocation of nation resources was geared towards more efficient utilisation methods.

2) Hijra was carefully planned to suit neatly the social framework from the point of view of agricultural techniques. For one thing the structure of Arabian society is paternalistic. The social bonds that constitute Ibn Khaldoun's asabiyya concept, which precisely underly the kind of communal interests and incentives of hijra, provide clues to explain both the success of hijra and the original manner in which Ibn Saud has tied the pastoralist Bedouin to the soil and permanent irrigation systems. We are unable to assess the precise nature of the agricultural transformation which developed during early experiments with hijra because statistics which might throw a light on the level of agricultural productivity during the rise of hijra are absent. Yet the scale and the framework which designate hijra have made it possible to infer that traditional techniques were improved. There are conflicting reports on the exact number of hijra settlements. A. Rihani listed sixty hijra in one book, but 84 hijra in another.¹ One thing is, however, sure, hijra continued to grow and develop during and after the publication of these books. According to Mac-Kie Frood,² hijra jumped to 140 on newly-tapped water reserves and, more important: "There was not one bedouin tribe in Arabia that had not established one or several hijras and had not been converted in greater or lesser degree to crop farming".³

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1. Amin Al-Raihani, Ibn Sa'ud of Arabia, His People and His Land, (London, 1928), pp. 191-198.
 2. Mac-Kie Frood, quoted by Charles Issawi, The Economic History of the Middle East 1800-1914, p.347.
 3. Ibid., p. 162.

Various hijra communities have either disappeared or old names have been replaced by new ones, a situation that makes it difficult to allocate the location of hijra settlements among the various tribes. Nevertheless, a map based on the old, conventional tribal districts, Fig. 5.1., indicates the pattern and the magnitude of hijra spread.

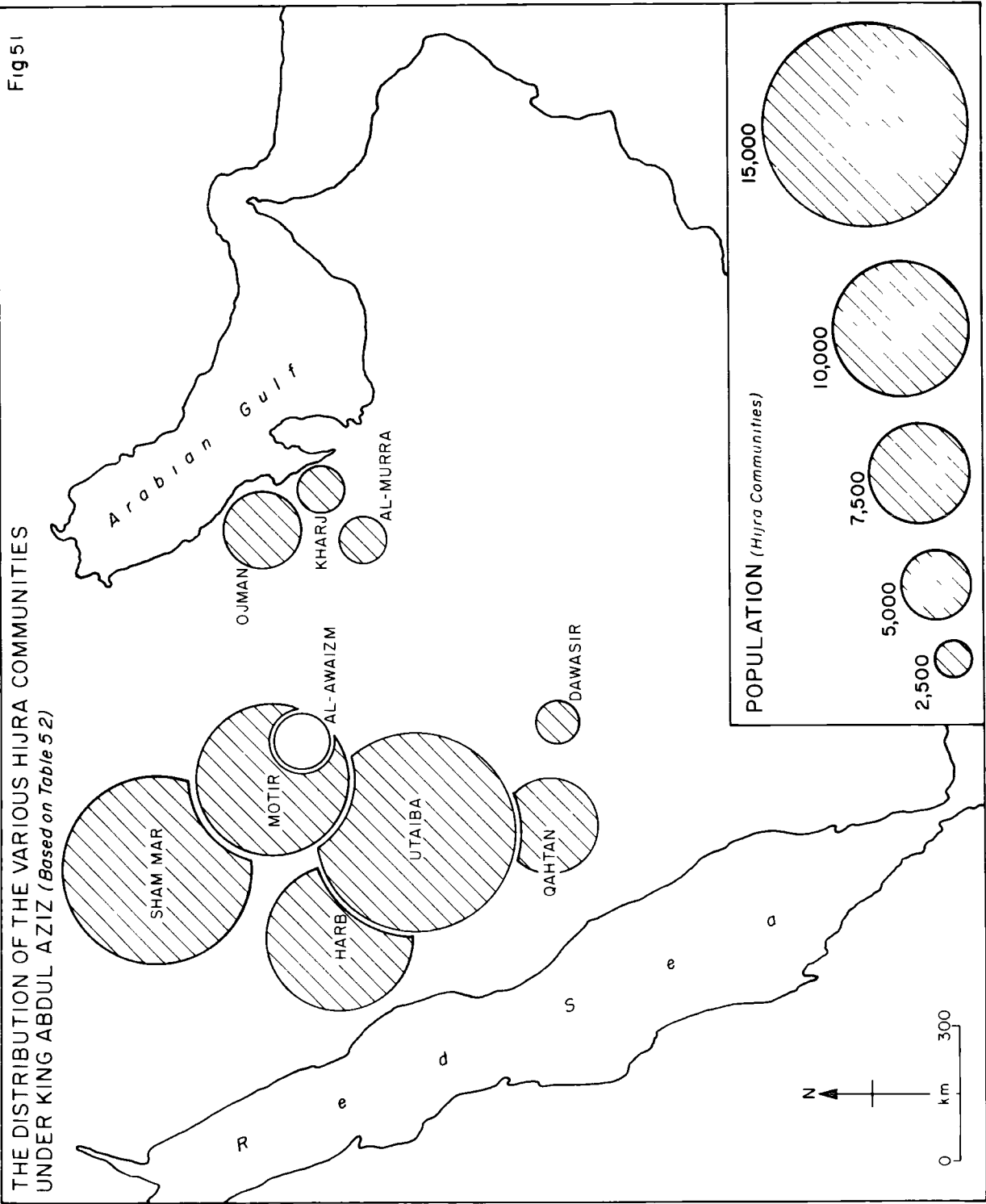
Although both Rihani and Mac-Kie Frood have stressed hijra as settlement programmes and touched on the early process of agricultural transformation, the question of how the Arabian community experienced such a significant alteration and whether hijra signifies a phase in a changing agricultural scenario is rarely raised. Or to put it differently, to what extent has hijra's escalation affected the nature of traditional agricultural techniques?

Indeed, hijra created relatively favourable opportunities for the development of human resources after years of under-utilisation in four ways:

- 1) it induced new patterns of specialisation;
- 2) it changed the occupational structure;
- 3) it made the orientation of Arabian culture highly susceptible to technical change; and
- 4) it induced an Arabic literary renaissance.

5.2. Specialisation within Traditional Agriculture

Such development has rarely been given due recognition as a dynamic factor in improving available



traditional tools and time-honoured techniques. Obviously, most of the literature tends to stress the application of modern techniques. Such application is, however, a very recent phenomenon which does not take account of the improvement of traditional methods such as ploughing and storing dry grass and herbs. The main lines of technical evolution initiated by the hijra event are not hard to identify. Substantial improvements in the utilisation of natural pastures were developed on a national level. Hima (grazing areas protected at specific times)⁴ introduced the organisation of a grazing system. This is more than a system for the development and production of livestock. It is a transitional phase from merely natural pasture to planted pasturage⁵ in which planning for animal fodder can reduce the natural vagaries. This is not, however, to say that a radical departure from pasture (free-ranging practices) has been achieved; it is only that an evolutionary phase has developed within a predominantly pastoralist economy.

In this respect the relation of this development to traditional techniques needs further elaboration. Hijra has raised the technical level by accelerating the adoptive process and the optimisation of the productive efficiency of livestock. In the chapter on capital we have already discussed the organic nature inherited in the traditional forms of capital. To put it differently: capital which takes the form of livestock and land

4. Supra, p.

5. Cynthia Nelson, The Desert and Town, Nomads in the Wider Society (Univ. of California, 1973), pp. 24.25.

holdings might be broken down into complementary parts.⁶ For without the cultivation of cereals, planting of trees, and herding and production of livestock, capital is unlikely to develop, and the more important markets would completely disappear. The type of specialisation in traditional agriculture has been created by the peculiar social organisation of Arabia and not vice versa. This is why the adoptive process has developed smoothly and on a large scale. An illustration can be given. The sedentary farmers of Madina, Yunbu and Khayber originated in the wandering bedouins within the framework of the nation. Thus their adaptive response to pastoral technology stems from the complementarity of the Arabian pastoral economy with the relative social homogeneity.

In the absence of statistics that might show the extent of productive efficiency in agricultural work--such as ploughing and animal production--we can reasonably infer that sedentary life is a basic condition for improvement in traditional techniques in at least three spheres. Firstly, the relative improvement in traditional management produced by hijra has led to an increase in the capacity of both periodical and permanent suqs. The form of wealth which verges on self-sufficiency and hardly necessitates labour units larger than the family, changed after the development of the hijra since market structures have encouraged further specialisation and the previous tribal territories producing insecurity of communications have been replaced by one single national territory. The

6. Supra. , p. 124.

improved security has consequently led to a relative increase in production efficiency. Secondly, the previous grazing system, which was largely based on tribal territories, not only constantly constrained the range of choice but also killed the competitive spirit which is an essential condition for production allocation of natural resources. Full credit should be given to Ibn Saud who, by adopting the Islamic rule, made the accessibility to grazing areas a natural right for everyone. According to the Prophet three assets, namely water, grass and fire, are the common birth-right of man. It was according to this rule that the competitive grazing system was attained. Thirdly, lack of adequate records and data have made it difficult to examine certain relevant factors of changing traditional techniques. Moreover, the available literature has been founded upon the assumption that Arabian traditional agriculture was either backward or stagnant.⁷

Unfortunately, we are unable to examine certain practical problems. Among these is the question of how far learning...by doing the daily business of cultivation can explain improvement of inherited agricultural methods and whether or not the farmers abandon these ancient ways of cultivation. However, the weakness of the assumption of backwardness and stagnation becomes clear when three facts are taken into consideration:

1) Prior to oil discovery, the country was a net exporter of dates and certain livestock such as camels;

7. Charles Issawi, The Economic History of the Middle East 1800-1914, pp. 334-347.

2) Sustained trade between cities; and

3) The growth of villages in the western and southern parts of the country.

The three facts suggest that traditional techniques were hardly stationary otherwise cities might have shrunk and villages disappeared, as well as trade.

Moreover, the pattern of specialisation which developed within traditional agriculture represents strong evidence for an improving technical level. Such evidence is based on the recent available data on the economic geography of the country.⁸ There are two types of specialisation: 1) narrow specialisation, and 2) broad specialisation. Examples of narrow specialisation occur in several places, as in the concentration of palm trees at Madina, Khayber, Ymbu and Wadi Fatima. An advantage of narrow specialisation is in its contribution to skills in cultivation, irrigation, reaping and in the development of a remarkable dexterity in handicrafts in the main cities. This is why artisan industries such as the making of tanned hides, ropes, carpets, mats, fans, cages, pots and bags, absorbed so large a number of workers and flourished until the discovery of oil. One disadvantage of specialisation stems from the extremely sensitive agricultural economy, where unfavourable physical conditions and natural vagaries such as drought, floods and harvest failure occasionally have dangerous consequences. Indeed, this is a special case where physical conditions collaborate with sharp specialisation against improving

8. Kingdom of Saudi Arabia, Foreign Trade Statistics (Riyadh, 1969), p. 832.

Table No. 5.1.

Acres and Yields of the Main Agricultural Crops in 1950 and 1951

<u>Commodity</u>	<u>Areas Cultivated in Acres</u>		<u>Total Production</u>	
	<u>1950</u>	<u>1951</u>	<u>1950</u>	<u>1951</u>
Wheat	28,600	53,867	10,700	20,200
Barley	31,300	43,400	11,300	15,300
Dura	31,700	43,600	17,700	23,900
Dukhon	5,400	22,000	2,200	9,200
Rice	5,000	5,200	2,200	2,300
Lentils	620	1,100	200	340
Sesame	1,200	511	200	90
Dates	14,322	53,600	115,000	250,000

Source: F.A.O. Report No. 76, in Report to the Government of Saudi Arabia on Agricultural Development (Rome, 1953), p. 75.

technical methods.

Broad specialisation was confined to the areas around the main cities which were partly by the sharply specialised husbandry practices of the bedouin. In Madina, Wadi Fatima and Khayber broad specialisation took the form of cultivation of vegetables, cereal, dates fruit and alfalfa, and overall agricultural production increased as Table 5.1. reveals.

Yet experience of both types suggest that when the traditional techniques became obsolete, specialisation is no longer an accurate guide for agricultural policy. For example, in Madina there were at least thirty horizontal wells and seventeen in Khayber. However, they have almost completely disappeared (except for two in Madina and perhaps three in Khayber), since mechanisation arrived in the early 1940's. The main trends that have made hijra a point of departure lie in the growth of population in the cities and the subsequent changes associated with it, including shifts towards broadening specialisation in the form of occupational structure.

5.3. Early Technical Change and Occupational Structure

Estimates of population derived from inadequate statistics cannot satisfactorily account for the changes in structure of occupation which obviously occurred during hijra and after. Indeed, historians and geographers are agreed that Saudi Arabian technical changes have been

accelerated in favoured areas by two decisive events: the hijra programmes and discovery of oil. They may not have contributed to an immediate noticeable increase in agricultural productivity, but they did induce a dramatic change in absolute size of population in the main cities and villages. The reason for this is that the underutilization of human resources prevailing before hijra created an unbalanced relationship between population growth and traditional agriculture. The absolute number of population dependent on agriculture was rising, whereas the changing level of agricultural techniques was extremely slow (although never stationary).

How did hijra change the occupational structure? Full statistical evidence is unfortunately lacking, but the approach of this study is more qualitative than quantitative. Resorting to the number of hijra and the extent of their influence (which touched almost every tribe in Arabia - Fig. 5.1.), we can reasonably assert that new balanced relationships between agriculture and population were created by hijra. This is not because dramatically new techniques altered traditional agriculture, but because the number of people dependent on agriculture remained stable. It is the oil industry, as we shall see, which radically upset this stability created by the hijra.

Thus, the coincidence of the increasing effect of hijra on the one hand and the development of the oil industry on the other affected the occupational structure in two ways:

a) The absolute proportion of population dependent on agriculture dropped considerably. According to the First Plan the total labour force engaged in agricultural activities (1970) was only 46%, which is indeed a small percentage compared with other countries which share with Saudi Arabia similar cultural and economic conditions.

b) There was a growth of demand for skilled and semi-skilled labour. Table 2.4. represents the main feature of occupational structure which was in 1970 approximately 56,000 labourers. Furthermore, the total labour demand for the agricultural sector was estimated at 16,430 workers, including professional and administrators.

Both numbers are small fractions of the total labour force engaged in non-agricultural activities, and yet they are precisely consistent with the recent trends in overall labour supply and demand on the national level. reveals the following features:

1) There is an overall shortage in supply of labour, in all sectors of the economy,

2) The changes in occupational structure have occurred in three main patterns. Firstly, the shortage of skilled and semi-skilled labourers has been badly felt, which indeed reflects the rising level of technology.⁹ The previous technological level is no longer adequate. Secondly, a shortage of qualified persons, vocational and professional, has also developed. This shortage has been created by the tremendous growth in construction,

9. Saudi Arabia, Industrial & Development Centre, Guide for Industrial Investment in Saudi Arabia, (Riyadh, 1972) pp. 55-56.

trade, services and transportation sectors. Demand for unskilled labour is expected to absorb 142,000 workers or 44% of the total labour force, which makes an overall demand for the labour force of 61,722 skilled workers.

Changing income levels and the spill-over of government expenditures have a direct bearing on both populations and occupational structure both within and outside the agricultural sector. The hallmarks of these new trends have affected traditional techniques in a variety of ways. Agricultural activities are now largely motivated by economic incentives than by economic necessity. Furthermore, the present trends of sedentary life, promoted by hijra and accelerated by oil industry development, have produced a pattern of urbanisation which has made the demand for agricultural products no longer consistent with the previous level of traditional techniques.

Thus, oil discovery, urbanisation and a shift in population, mainly from the village to the cities, constitute new phenomena which mark a new level of Arabian technical civilisation. These are among the main trends which have affected agricultural technical progress in Western Saudi Arabia. The decreasing population dependent on agriculture in industrial nations was a natural consequence of the effective introduction of large-scale techniques and modernisation of agricultural methods, which not only create employment opportunities in non-agricultural sectors but also make them attractive and profitable. These conditions are

10. J.H. Richter, Agricultural Protection and Trade, Proposal for an International Policy, (N.Y. Fre. Praeger, 1964) pp. 3 7.

not, however, the case in Saudi Arabia. It is true that such shifts in occupational structure in Saudi Arabia have been created by the very strength of its growing economy which shares some of the traits of the economies of modern industrial nations. Yet the Saudi Arabian agricultural techniques are hardly growing at the same pace. The situation is quite complex.

The organic nature of agricultural transformation added other factors to the complexity of occupational shifts. These stem from the government's economic strategy which is mainly geared towards a policy of industrialisation.¹¹ As a result, economic planning and the industrialisation policy have encouraged occupational shifts in favour of non-agricultural activities. There are, in this connection two sides to the problem of labour shortage in agriculture. One is that the technical progress of the present Arabian civilisation has contributed to a rapid (in some cases sudden) decrease in the number of population dependent on agriculture. This is not because agricultural productivity increased, making a certain part of the labour force redundant, but rather because the growth of non-agricultural activities has made such shifts possible. This is why the total area of cropped land has shrunk, dates, cereals and livestock in particular dropping to a very low level. Indeed, some cultivators have been motivated by increasing prices of agricultural products but they have

11. Saudi Arabia, The Second Economic Plan, 1975-1980, pp. 26.30.

found that the resumption of traditional techniques is less profitable and sometimes exposes them to financial disasters. This is one of the main factors affecting agricultural technical progress at both government and private levels. The government responded to the growing shortage of some agricultural products and food supplies by various types of subsidies,¹² protection and technical assistance, while on the private level, farmers shifted from cereal production to vegetables which requires greater application of agricultural techniques.

5.4. Susceptibility of Arabian Culture to Technical Change

The links between cultural orientation and technical change are developing elements in human civilisation. The literature is full of examples where cultural factors have seriously retarded the technical development or have constituted essential elements of its progress.¹³

Thanks to a rich legacy, Saudi Arabia contains its own inherent reservoir of positive aspirations and cultural traits, highly receptive to the application of agricultural techniques, and offering ample examples of creativity. Nevertheless a relative backwardness of agricultural technology in the country is a fact that

12. Al-Madina Newspaper, No. 3397, (June 8th, 1975), Back Page.

13. Harold Brookfield, Interdependent Development, (London: Williams Clowes & Sons Limited, 1975): pp . 78-80.

has been examined in this thesis. Yet the distinction between the mere existence of the problem and the extent of awareness of it has rarely been taken into consideration. Factors that influence individual attitudes towards work cannot be ignored. Furthermore, the average Saudi farmer has a vivid memory of the long and bright past of Islamic civilisation, which, as we have tried to show on different occasions, represents an invisible force in terms of adaptive process.

We asked one farmer in near Madina: How do you visualise prospects for the advancement of agriculture in Wester Saudi Arabia? His reply was: "We are technically and mechanically underdeveloped, but we are spiritually and culturally highly developed nowadays; our future is going to be better than our present, or at any rate it is not going to be less than our past". This pattern of aspiration, if properly exploited, is a key for effective technical adaption, since it stimulates innovative acts in the ordinary daily business of agriculture and might well raise further incentive for the acquisition of modern agricultural techniques by means of wise savings. Thus, thrift might replace the destructive traditional habits of extravagant consumption and certain lazy attitudes towards work might be abandoned. Of course there is no sign that extravagant consumption, which sadly in certain cases goes far beyond a farmer's means, has been abandoned and there is no radical departure from such traditional values. Nevertheless, acquisition of agricultural techniques has

developed as a growing part of the overall Saudi Arabian contemporary civilisation. This is because development of the oil industry has raised the level of income which in turn has pushed prices of agricultural products to levels unequalled in the entire history of Arabia. Consequently, an incentive to adopt modern techniques has been induced and the farmers' receptiveness to the wide range of agricultural opportunities created by Western techniques has been positively stirred.

Another illustration of the way in which cultural forces influence the level of agricultural techniques may be given. Al-Jafor Oasis is one of the oases which, mainly due to water shortage and mismanagement of soil, reverted completely to desert in the 1940's. The location of the oasis at the foot of high mountains exposed the soil to constant erosion. Thus soil fertility was exhausted and the traditional system of irrigation became obsolete. Nevertheless, the deserted arid area was again converted into a green oasis in the 1960's. Causes of the resumption of cultivation lie in the application of modern techniques and the farmers' own innovative actions. Permanent crop cultivation and the plantation of palm trees have now continued for many years.

A similar pattern has been followed by other oases which have responded to the failure of traditional techniques by keeping pace with the general technical change. The drainage systems of Wadi Assafra and Yunbu have witnessed the abandonment of one hundred oases in recent years, yet recultivation is now developing as a

new phenomenon. The resumption of such oasis cultivation has been carried out by only a few enterprising farmers whose unmistakeable perception of technical change has guided them to innovate in a special way. They have discovered that the exhaustion of soil and the disappearance of horizontal wells can be compensated for by transferring underground water via pipelines to the neighbouring virgin and fertile land. Indeed, such an innovation has proved that their project is not only economically viable but is making them the most prosperous farmers nowadays. Furthermore, this is where private initiative is an essential condition. By itself, however, it is insufficient for improving the methods of agricultural techniques. It must be supplemented by the fact that cultural bias has made such projects financially possible. Thus, when national financial institutions denied them access to the capital needed for financing their projects (mainly pipelines, pumping-engines, seeds, fencing and demarcation expenses), the traditional institutions responded in a positive way.¹⁴ This was made clear in field studies by the author. The traditional institutions are part, indeed an integral part, of the Arabian civilisation and positive cultural traits that helped to shape the average individuals attitudes towards changing techniques,.

Another dynamic factor which helped to shape cultural orientation stems from the unique geographical

14. Field Work.

position which made the Western area a cultural gathering place. Again this has created favourable pre-conditions for both hijra and oil which are undoubtedly the decisive agents of technical change. Raphael Patai is one of the Middle Eastern scholars who has tried to show how the advantageous position of the area as a whole has facilitated adoption of Western technology. "While in general Westernisation means almost exclusively the adaptation of Western material-equipment-and-techniques only, exception was made in the case of nationalism which happened to fit into pre-existing scheme of ideas".¹⁵ In this connection, both Westernisation and adaption of modern techniques are intended to explain the extent to which an application of science might change.

5.5. The Arabic Literary Renaissance

The acceleration of the adoption of hijra and the factors of Westernisation have had profound repercussions for both villagers and urban dwellers. Hijra is an agricultural community, predominantly illiterate. However, enlightening practices emerged as mobile schools for the villagers were introduced. Mosques in the cities resumed their traditional functions which are not merely directed towards education but towards the totality of life. The pilgrimage (Hajj), like an international conference, has added another dynamic factor to maintain a regular exchange of ideas and to vitalise

15. Raphael Patai, "The Middle East as a Cultural Area" The Middle East Journal, 6 (Winter, 1952), p. 15.

literacy, not only as a channel of communication with the outside world but also to maintain a relative social mobility. Thanks are due to Ibn Saud who spread safety and security and encouraged immigration into Makka and Madina.

Consequently, large-scale urbanisation has developed in the main cities of the country especially Makka, Madina and Jedda. The links between these developments and changing agricultural techniques are obvious. In the first place population growth and land congestion emerged and fragmentation of holdings continued. On the other hand, the growth of new villages such as Solslah, Swaidrah and Al-Fraa have developed in such a way that land congestion has been reduced. In the second place growth of villages and cities gave rise to increasing demand for agricultural products, which in turn encouraged further permanent cultivation. Concomitant with the consequences of hijra was the discovery of oil and diffusion of westernisation which indicate that the forces which have affected the Arabian agricultural transformation are gradual and evolutionary.

As implied in the opening statement of this chapter, hijra improved traditional techniques in an original manner. It raised traditional techniques in the form of reducing underutilised human resources and cultural orientation favourable to technical changes. Again, the oil industry introduced cultural interaction not only from pilgrimage but also through contact with Europe via trade. In fact the contact with Europe is

is as old as trade among nations. The commercial importance of Hijaz has been reported by several writers.¹⁶ We are not concerned about trade per se, it is mentioned here as evidence of the long history of contacts with European nations (Great Britain, France and the Netherlands).

Connections between technical improvement within traditional agriculture and favourable cultural orientation hardly needs further elaboration. Suffice it is to say in this regard that Arabian cultural traits and receptiveness to technical change are an invaluable national asset and an unmistakable guide for technical agricultural adaptation. It goes without saying that full understanding of cultural traits and extent of readiness of an average Arabian farmer to accept technical change is essential for policy makers.

16. Great Britain, Accounts and Papers, Report on Trade of Jeddah Vol. C. (1912 - 13)

Table 5.2.

The Various Hijra Communities

Established Under Ibn Saud

A. <u>Mutair Hijra</u>		D. <u>Al-Rawqah Hijra</u>	
1.	Al-Irtawia 2000	1.	Al-Dahna 2000
2.	Mabaydh 1000	2.	Al-Soh 300
3.	Fraithan 1000	3.	Sajer 800
4.	Mulaih 700	4.	Arja 2000
5.	Al-Imar 700	5.	Osaylah 300
6.	Al-Athlah 1000	6.	Nafi 2000
7.	Al-Irtawia 600;	7.	Holaifah 300
8.	Musaikah 800	8.	Honaidel 1500
9.	Dhoraih 800	9.	Al-Barud 300
10.	Quriah The Upper 1500	10.	Qubah 700
11.	Quriah The Lower 1000	11.	Al-Fawwarah 1000
	11100		10800
B. <u>Qahtan Hijra</u>		E. <u>Barqah Hijra</u>	
1.	Al-Hayathim 800	1.	Irwah 1000
2.	Al-Haythim* 1000	2.	Al-Sanam 1000
3.	Al-Jafeer 300	3.	Al-Rawdh 700
4.	Al-Hasah 800		2700
5.	Al-Rain The Lower 2000		
6.	Al-Rain The Upper 2000		
	6900		
C. <u>Al-Dawsir Hijra</u>		F. <u>Al-Awazim Hijra</u>	
1.	Mushairqah 1500	1.	Thaj 1500
2.	Al-Waseetah 800	2.	Al-Hosy 1000
	2300	3.	Al-Hannat 1000
		4.	Al-Ateeq 700
			4200
		G. <u>Al-Outqut Hijra</u> 5000	

Table 5.2. Continued

H.	<u>Bany Murrah Hijra</u>		K.	<u>Continued</u>	
1.	Al-Shobbak	1000	13.	Al-Masaa	700
2.	Abreeq	1500	14.	Al-Murair	400
3.	Ain Dar	1000			
		3500			13800
			L.	<u>Al-Kharj Hijra</u>	
I.	<u>Ugman Hijra</u>		1.	Al-Dhobaih	800
1.	Al-Sirar	2000	2.	Al-Badaa	700
2.	Honaidh	1000	3.	Al-Maisaf	600
3.	Al-Sihaf	800	4.	Al-Akhdar	500
4.	Al-Oqairah	700	5.	Tebsem	400
5.	Orairah	1300	6.	Al-Rwaidah	400
		5800			3500
J.	<u>Harb Hijra</u>			<u>The Aggregate Various</u>	
1.	Dokjnah	2500		<u>Hijra Communities, 1926</u>	
2.	Al-Shobaika-	1000		<u>Total</u>	
3.	Al-Dolaimeyyah	1000			
4.	Al-Qurain	700	Mutair		11100
5.	Al-Saqiah	600	Qahtan		6900
			Al-Dawasir		2300
		10800	Al-Rawqah		6900
			Barqah		2700
K.	<u>Shammar Hijra</u>		Al-Qutqut		5000
1.	Al-Ajfar	2000	Al-Ugman		5800
2.	Hutaim	1500	Harb		10800
3.	Al-Fotaim	600	Al-Awazim		4200
4.	Al-Qusair	900	Bany Murrah		3500
5.	Al-Blaziah	500	Al-Kharj		3500
6.	Al-Khobbah	800	Shammar		
7.	Al-Ghaidhah	1200			76500
8.	Baidat Nutail	1500			
9.	Al-Tem	600	<u>Source:</u>	Al-Raihanī, Najd	
10.	Om Al-Qulban	500		Wa Mulhawatiha,	
11.	Al-Shoqaiq	400		pp. 454.456.	
12.	Khoraiqut	1300			

CHAPTER SIX

National Policy for Agricultural
Transformation

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Introduction

In the previous Chapter hijra has been considered as a turning point to mark the first phase in the course of agricultural transformation.

This Chapter is an attempt to analyse present national policy for agricultural transformation, which in fact represents the second phase in the processes of development.

The issues are examined under five sections:

Section one reviews the objectives of national policy and the choice of agricultural techniques.

Section two considered the impact of economic structure on agricultural research. Section three examines the ramifications of the settlement projects. Section four considers the national target for fostering social integration. Section five reviews new trends affecting agricultural policy.

6. National Policy for Agricultural Transformation

6.1. National Objectives and Choice of Agricultural Techniques

The main objectives of agricultural programmes in Western Saudi Arabia, as well as at the national level, are to increase agricultural production; to improve the level of wealth in the bedouin economy : and to encourage settlement and a population shift from agricultural activities to the industrial sector. Choosing techniques to achieve these objectives has proved a difficult task, particularly in dealing with the country's physical conditions, i.e., the huge size of the national territory and the difficulty of securing regular water supply. Growth of the transportation net has mitigated problems of long distances but has not yet eliminated them (Fig. 1.5.) A recent report on water problems maintains that :

There are sizeable reserves of underground water supplies but what is needed is a wise water policy for organising the present water network and suitable water management. Once these conditions have been met and regular research for water maintained, the national needs for water supplies will be ensured.¹

The choice of agricultural techniques is influenced by

1. Saudi Arabia M A W, Agricultural Development in Saudi Arabia (Unpublished Report, in Arabic, 1976), p.1.

physical constraints; land holding size; introduction of new varieties; and development of national institutions and the direction of investments.

6.1.1. Physical Constraints on the Choice of Techniques

Experimental stations in Madina and Abha as well as research reports in these areas have so far made it clear that the scale and the level of techniques depend on the nature of soil - the availability of water - and transportation facilities.

Al-Figra is a traditional agricultural area producing wheat, barley and, more important, select dates which are famed throughout Western Saudi Arabia. Yet neither Madina nor Jedda benefitted from Al-Figra agricultural products as they should because of the mountainous nature of the land and the transportation costs. At a time when these areas were functioning as subsistence farms, costs of transportation were not major problems because most of the produce was consumed locally and only a little grain and a few dates are exchanged for luxurious goods, such as coffee, at Madina or Jedda.

In recent years, however, some farmers have engaged in selling their produce in the major towns. Consequently, they face two problems: one is the

transportation and another is the choice of techniques. For instance, Abha and Al-Figra farmers have abandoned their traditional agricultural practices such as producing wheat and barley. They have shifted to tomatoes and the cultivation of other vegetables.

The M A W Unit manager showed the present writer a great deal of abandoned land suffering from erosion. The government responded by an afforestation scheme which, although it covered some areas, still left other districts threatened by eventual soil erosion. Thus both the individual farmer and the government have to decide the choice of techniques suitable to the present circumstances. Maximisation of agricultural production in Western Saudi Arabia requires various techniques, e.g., while the Asir area entails "a forestry programme in which a system of Forest and Grazing Reserves would be established"², Madina needs to develop alfalfa crops.³ Though both techniques are designed to conserve soil and increase production of livestock, various methods of implementation seem essential.

Furthermore, until recently, cheap labour represented an excellent substitute for capital and was

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2. F A O, Report to the Government of Saudi Arabia on Pasture Development and Range Management (With respect to increasing livestock production), (Rome, 1965), p.11.
 3. Ibid, p.8.

responsible for the agricultural exports which found their way to the neighbouring countries. However, this means in practice that the keeping down of the cost of agricultural produce does not arise from genuine innovation but mainly from cheap labourers who gain practical skills with time. Yet since securing reasonable agricultural surplus is unlikely without adjustment to the changing physical and human conditions we can assume that the changing level of agricultural techniques took place mainly on the human side. Labour organisation, land use and traditional capital, rather than modern capital, were the factors of agricultural production within which the evolution of agricultural techniques emerged.

6.1.2. Land Holdings

Land fragmentation is a universal problem as far as absorptive capacity to invest and capacity to introduce technology are concerned. One cannot ignore the strong points of the argument that agricultural techniques neither become economically significant nor practical unless large scale consolidation of land replace fragmented small holdings.⁴

There are various factors which accelerated the

4. Herman M. Southworth and Bruce F. Johnston, ed., Agricultural Development and Economic Growth (N.Y. Cornell University Press, 1967) pp.234 - 236.

process of fragmented land holdings in Western Saudi Arabia. Division of land between heirs is based on Islamic rules, and so division and sub-division are expected to continue until the holdings reach the marginal limits or beyond. Yet, for economic reasons such a process has rarely happened in practice. Heirs are well aware that division and sub-division will eventually lead to a point beyond which land will cease to have any economic value.

Indeed, small holdings are the main features of land in Saudi Arabia, because the limits on land expansion and emergence of large holdings have been created by the physical conditions of the country. Thus, small holdings are more the result of natural causes than human causes.

The choice of techniques is influenced by locational patterns in Western Saudi Arabia cultivation in the Abha and Al-Figra mountains is an illustration of the small holding system which dominates such places as these. Terraces in both locations are the basis of the traditional farming system in Western Saudi Arabia which offers an economic advantage in the form of employment to many farmers who might otherwise be unemployed. This contrasts with the farming system in the Qasim and to some extent in Madina, where relatively

large-farming patterns have developed in recent years. The activities of the government tend to show more encouragement to large-size farming directly by M.A.W. and indirectly through the Agricultural Bank.

6.1.3. Introduction of New Plant Varieties

Until recently farmers have shown no significant interest in introducing new varieties because they believe that traditional strains are the best varieties for adaptation, which is true in the case of Western Saudi Arabian dates, these have been described as possessing a rich botanical inheritance, probably unequalled in the rest of the Middle East area.⁵

It is very sad to see that the sale of palm tree products is becoming less and less economic. This is a discouraging factor for the introduction of new techniques in the crafts associated with the palm tree, and will also make dates a lagging industry. There are various factors acting against the introduction of new techniques in the field of dates.

1. The importance of dates as a cheap food has been lessened by the general increase of income level immediately after the introduction of the oil industry. Oil revenues

5. Paul Popenoe, The Date Palm, (Miami-Coconut Grove, Florida, 1973), pp. 174 - 77.

made it possible to import a wide range of good quality foodstuffs.

2. When consumers found substitutes for dates, palm-tree cultivators had no incentive to expand their palm-trees or to introduce new techniques.

On the positive side, farmers learned by experience that certain crops are more profitable than others, so when they abandoned date production (sometimes leaving the dates unharvested on the palm-trees) and responded to the increasing demand for vegetables, they could not do so unless they introduced new techniques of farming. But again, the introduction of new techniques is a slow process which makes waves of diffusion of techniques, taking a great deal of time before modern agricultural techniques fully replace the traditional methods. Past experience, however, suggests an eventual overall increase in agricultural production. For instance the targets for increasing agricultural production are based on experiments in recent years at Al-Hasa station, which proved that baladyla lambs and Dutch breeds are promising and worthy of diffusion. The same thing is to be done with wheat varieties, as recently reported:

One outstanding success has been recorded. Wheat production, for instance, rose by 68% to more than 150,000 tonnes in 1974 - 1975 - two fifths of 1980 target. This increase is largely accounted

for by the higher-yield Maxipak variety, which the Government intends to extend to the entire area under wheat cultivation by the end of the Plan period.⁶

Vegetables and melons, as Table No. 6.1. reveals, are among the top priorities for future production.

6.1.4. Development of National Institutions

Saudi Arabian agricultural policy regarding technology has been shaped by two distinct factors. As a transitional nation, she has to develop her own institutions to deal with changing social and economic conditions. Institutional functions and her acquisition of agricultural techniques have undergone considerable change. Initially, economic planning was intended to deal with the financial crises (1956 - 1957), trying to achieve financial stability.⁷ The Supreme Planning Board (now the Ministry of Planning) was established in 1961 to draw up a policy of economic development, to plan an economic development programme, and to co-ordinate, supervise, and follow up its execution.⁸

Thus the improvement of agricultural technology became an integral part of the national policy. The Second Plan (1975 - 80) contained four targets for

6. "Saudi Arabia". Financial Times, Monday March 28, 1977, p.24

7. Sa'id Adam, A Development of Planning Organisation in Saudi Arabia, (Saudi Arabia, 1965), pp. 1 - 4.

8. Ibid., p.9.

TABLE No. 6.1.

Current and Planned Production of
Livestock and Imported Crops

Livestock (1974-75)	Current	Estimated Production
Sheep and Goats	(, 000 tonnes)	Target (180)
Milk	60	111
Meat	18	26
Camels		
Milk	40	50
Meat	6	10
Beef	5	11
Birdless	7	20
Eggs	90	140
Milk	85	120
Meat	3	8
Crops (1970 - 71)		
Wheat	74.2	250
Surghum	147.4	225
Millet	162.5	200
Barley	6.7	10
Vegetables	176.4	300
Melons	470	730
Dates	224.3	300
Citrus	13.1	20
Alfalfa	180	250
Cotton	-	7
	1970 - 71	Target
Irrigated	121,000	171,000
Rainfed	404,000	404,000
Total	525,000	575,000
Irr. Water(mi. cu. met)	1,850	2,500
Fertiliser	18,800	800,000

Source . Saudi Second Development Plan, Ministry of
Planning, Riyadh, 1976.
(Unpublished Version of the Plan Draft) p. 18.

agricultural advancement of technology, water resources development, an overall agricultural reformation and an increase in agricultural productivity through mechanized methods, an increase in the levels of income for bedouins, still engaged in agriculture, and the transferring of the redundant labour to non-agricultural sectors.⁹

In order to achieve these objectives the government is trying to secure 3.1% annual growth in the Saudi labour force between now and 1980, as Table No. 6.2. shows. This can be done by drawing some workers from traditional agriculture into the modern economic sector.

To appreciate the practical difficulties of dealing with an overall economic problem and the implementation of a national policy for the application of science, a brief comparison of production systems in both Saudi Arabian industry and traditional agriculture can be made. The problems of seasonality and the aridity of the land mean that the system of agricultural production is governed by unstable growth and changes, whereas industrial production, predominated by the development of oil, is essentially a regularly maintained process. Nevertheless, both traditional agriculture and the modern industry of Arabia depend on the same factors of production : land,

9. Al-Madina Newspaper, p.1, July No. 3424, 1975.

Table No. 6.2.

Planned Growth of Labour Force

	Numbers in thousands		Annual Growth Rate (%)
	1975	1980	1975 - 80
Saudi men	1259	1470	3.1
Non-Saudi men	306	767.6	20.2
Subtotal	1565	2237.6	7.4
Saudi Women	27	48	12.2
Non-Saudi Women	8	45	41.2
Subtotal	35	93	21.6
Subtotal Saudi	1286	1518	3.4
Subtotal Non-Saudi	314	812.6	21.0
Total	1600	2330.6	7

Source: Ministry of Planning, Riyadh, 1976 Saudi Second Development Plan, (Unpublished Version of the Plan Draft), p.21.

capital, labour and co-operation. The aridity of land and the shortage of skilled labour are crucial factors in the government policy. Such factors derive their importance from their influence on the structure of the economy in general and agricultural technology in particular. This is why the Second Plan allocated a large budget for educational development, unequal to any other item except national defence, whereas the water and desalination budget was almost half (U.S. \$ 10 m.) the expenditure on education.¹⁰ These new trends are examined in fuller detail at the end of this chapter, so it is sufficient here to supplement these trends by a few comments regarding national planning of agricultural techniques and the application of science.

6.1.5. Direction of Investments

Volumes of investment allocated for agricultural technology and science are usually taken as indicators of technological advancement, which is generally correct. Yet when the transitional conditions and the economic structure are taken into consideration the validity of such indicators is questionable. In advanced nations the policy of science is concerned with science regulation (such as

10. The Economic Development Plan, 1975 - 1980, p.29.

patents) and science creation, whereas in Saudi Arabia such policy is geared towards science importation and adoption.

Significance of Saudi Arabian policy lies in the direction of investments devoted for technology development rather than amounts of such investment, viz., policy orientation and the connections of investments with national problems. Policy orientation can be divided into two main approaches.

(a) The direct economic approach which is intended to stimulate the majority of farmers' demand for fertilizers, insecticides and agricultural machinery. But since such technical activities are in the early stages of adoption they should be supplemented by government action, viz., agricultural extension, demonstrations, and other activities in research and experiment stations. Other economic incentives are the prospects of the yields. The majority of the illiterate farmers cannot be expected to develop an ability to forecast future needs. The task of the government to communicate with an ordinary illiterate farmer is challenging, because convincing through stimulating economic factors is unlikely to develop unless the farmers have a reasonable idea about both physical quantities and prices of their proceeds. Their knowledge of prices is usually imperfect because the majority of the

farmers have not yet developed the habit of forecasting accurate prices.¹¹ It is true that there is a general tendency for prices to go up, yet prices of the new input of techniques add another difficult factor for the farmers to anticipate. Thus various specialists are needed to deal with the introduction of machinery, tools, equipment and marketing prospects. Lack of specialists are a major determinant factor in the government policy. Inviting experts from abroad is the only alternative until local skills can be developed. Yet even at that stage diffusion of agricultural techniques requires a totally integrated but flexible government approach.

(b) The Social approach is designed to aid the general modernisation of agriculture and non-agricultural activities as well, which in fact covers the area outside the narrow line of agricultural experts. Mechanical engineers and fertilizer experts may not be aware of potential bedouin resistance to the adoption of innovation, which from the bedouin's point of view is surrounded by uncertainty. Indeed, in the south-western area of the country, especially in deep wadis, both uncertainty and passive attitudes towards the adoption of technical improvements are widely observed. This is because certain traditional values are considered as an essential

11. Field work, Review with M.A.W. Unit in Abha.

part of their social system, so it is feared that the introduction of new techniques might interfere with traditional values. Fortunately, such a segment of the population is rapidly diminishing.

Potential suspicion cannot however be underestimated among certain sections of illiterate farmers, of whom some are ill-informed and ignorant. So, the nature of such a problem suggests possible remedies. The art of persuasion¹² and demonstration is one possible area, which is at present exercised by outside experts. However, once an expert gains the confidence of the bedouins or farmers they are highly amenable to his advice or technical recommendations.

The spread of general education is a good channel to create a suitable climate for the introduction of new technology. Furthermore, technical education in fields of engineering and agriculture are contributing factors to the adaptation to modernization techniques. The extent and rate of diffusing modern agricultural techniques have been seriously retarded by the country's physical conditions.

Fortunately there are two dynamic factors which

12. There are various programmes solely for farmers which are heard almost every day via broadcasting from stations at Riyadh and Jedda.

have facilitated the introduction and adoption of modern techniques; the economic structure and cultural traits. It has already been implied that simplicity of the economic structure did not create a hierarchical mode which might encourage certain groups to resist adoption of innovations. Resistance to the introduction of innovations develops only when land proprietors are threatened with the loss of their economic privileges. The physical conditions of the country made the small holdings dominant features.¹³ Disadvantages of small holdings in terms of capacity to absorb modern capital are obvious, yet such disadvantages lie on the side of physical conditions rather than human attitudes.

Cultural factors which are a potential trap for technical development in certain developing countries hardly exist in Saudi Arabia. This is due to the absence of a rigid social structure and to the richness of Arabian civilization.¹⁴

13. Saudi Arabia, Saudi Arabia Monetary Agency, (1976), p. 22.

14. Ilal Al-Fasi, Al-Naqd Al-Thati (trans. Self-criticism), (Beirut), pp. 151 - 52.

6.2. Impact of Economic Structure on Agricultural Research

The oil industry is a dominant sector of the Saudi Arabian economy. So the possibilities of oil substitution or future discovery of more oil might increase the oil supply on an international level and this undoubtedly will endanger the Saudi economy.

Sensitivity to this type of economy has been recognised and solutions for diversifications have been advocated in both the First and Second Plans. Yet, the questions of how and why the economic structure affects agricultural research are hardly considered.

Key issues relate to the manner in which a certain level of agricultural productivity can be increased or maintained. Indeed, agricultural statistics show a general tendency towards increased productivity, though careful analysis is needed to see whether such an increase is related to increases in the total area of cultivated land or is generated by new techniques of production.

6.2.1. Problems of Late Development

Various international organisations have been invited to deal with different fundamental national problems. The diverse activities and programmes of United Nations

and private agencies have started with preliminary issues such as surveys and the compilation of vital statistics. Moreover, a great many of these organizations' activities have been shaped by the nation's special economic structure and the present transitional era. The proven agricultural techniques in advanced countries may, therefore, place Saudi Arabia in a relatively advantageous position for adopting the most up-to-date innovations.

6.2.2. Research and Development

Until recently efforts to promote agricultural research have taken the form of exploration for new underground water sources, information gathering, training and the development of skills. In advanced countries, not only are such problems solved but a well-established scientific research system has made the use of applied science possible. These conditions in most of the developing countries are lacking, and Saudi Arabia is no exception. The country has started a new era of applied agricultural research and more basic science. Indeed, experimental stations and projects such as Qatif and Jazan are good examples of applied science in agricultural fields. In fact the country is experiencing a new era of basic research but it is still

in the early phases of agricultural transformation. Furthermore, an undiversified economic system has meant that agricultural research must be an integral part of national economic policy. Relating agricultural research to the general framework of the national policy has helped produce both advantages and disadvantages. There are several disadvantages because expenditure on agricultural research might be reduced. This would stem from other economic sectors competing for the available national resources and scarcity of skilled men and technicians. This is what makes research and development programmes far beyond the capacity of Saudi Arabia to deal with alone. As an illustrative example of extent and range of the problems of research and development programmes, Saudi Arabia invited I.L.O., U.N.E.S.C.O., W.H.O. and the Ford Foundation to deal with various inter-related aspects pertaining to research and development.¹⁵

Allocation of the annual expenditures on the national development programmes made it almost inevitable that the share of agricultural research was less than it should be. This is why most of the expenditures on agricultural research are basically research orientated.

15. Infra, p. 236.

6.2.3. Connecting Agricultural Research with National Policy

The advantages of connecting agricultural research with the national economic policy are numerous. First, it has conditioned the basic research and settlement programmes in favour of both immediate national needs and improving agricultural techniques rather than the traditional prestigious issues such as the acquisition of industrialisation per se. Indeed, as a transitional society, Saudi Arabia is no exception. We cannot afford to ignore the urgent social and economic needs in the sphere of public utilities, city planning, education and hospitals, especially when these amenities constitute top of priorities.

Furthermore other advantages of connecting agricultural research with economic policy tend to stir the proper response to the shortage of food supply. For example the recent trends of an upsurge in international prices of agricultural products, coupled with decreasing livestock, have made it clear to Saudi Arabia that the seriousness of such national problems requires both short-term and long-term agricultural programmes.¹⁶

16. An interview with the Minister of Saudi Arabia Planning, quoted by Al-Madinah Newspaper, 1, July 1975.

This underlies the current policy which leans towards subsidies and other arrangements to induce further agricultural production. This is not perhaps an ideal action, but there would seem to be no alternative. Thus related problems underlie the implicit policy by which Saudi Arabia endeavours to reduce her economic vulnerability. Indeed, effective research can develop only when applied science becomes an integral part of the agricultural production system, which is unlikely to occur as long as the agricultural system is still in the early process of adjustment for further transformation. This is because in order to initiate up-to-date agricultural techniques, starting from almost nothing, certain old methods should be abandoned.

6.2.4. Growth of Local Demand for Improved
Agricultural Technology

Signs of agricultural transformation and technical changes appear positive ones. This is because the demand for improved agricultural techniques in the area under study is growing at a favourable rate. Even though this may not be taken as strong evidence that the production system has generated sufficient demand for new techniques, changing patterns of demand for agricultural products is nevertheless in favour of agricultural

transformation. Total growth of agriculture at the national level is increasing. Total agricultural production is admittedly not very large in relation to the Kingdom's present gross domestic production or when its relative size is compared to the relative importance of agriculture in the economies of neighbouring countries. However, a projected rate of growth of about 5 per cent places the agricultural sector in first place when compared with the growth rates of the agricultural sectors of other countries of the Middle East and North Africa.¹⁷ The importance of such trends, however, stems not from the aggregate growth of agricultural products but from its composition. In this connection, Asfour in his report stated that "the projection of domestic supply shows that by 1975 the projected output is above 1960 - 64 level by 81 - 118% in the case of wheat and barley, 73 - 111% in the case of all cereals, 138 - 218% in the case of the vegetable group, 80 - 168% in the case of fruit and 0 - 9% in the case of dates"¹⁸ which is proved to be correct.

Increasing oil revenues have altered the structure of demand for agricultural products. For this reason much of the production of dates has been replaced by the

17. Edmond Asfour, Long-Term Projection of Supply and Demand for Agricultural Production in Saudi Arabia (Beirut: Econ. Inst. A.U.B. p.99.

18. Ibid., p.66

growing of tomatoes and other vegetables. Livestock production has declined as well. Additionally, aggregate demand for agricultural products is unstable and difficult to forecast because the socio-economic factors are rapidly changing. In this way the imbalance of industrial and agricultural growth has created a special pattern of demand for agricultural products favourable for the application of modern agricultural techniques. This is because rising consumption and the failure of agricultural production system to satisfy such demands or to secure an agricultural surplus have made many shifts in agricultural resources and have directed most agricultural expenditure to more creative investment.

6.2.5. Creation and Development of Skill

Experience in Western Saudi Arabia shows that improving agricultural techniques involves the creation of skills to meet the immediate pressing needs and also the development of skills necessary for balanced transformation and future prospects.

The general formal education and training of Saudis in European countries is aimed at skill creation. Problems of transitional society, however, may not be solved by education alone. As Fields concludes : "...

the educated would always seek high level high-status jobs and never seek or accept low-level jobs which would dirty their hands." ¹⁹ Some agricultural experts believe that it will take several generations to create competent Saudi farmers. ²⁰

There are certain fundamental problems inherent in Saudi agriculture which in turn have divided the research policy between the creation of skills and the development of skills.

1. It has been already implied that the quality of Saudi labour had deteriorated before hijra. What application of modern techniques means is that labour is highly susceptible to writing and reading in order to carry out instructions. Thus the education programmes and anti-illiteracy schemes have been developed as part of an overall national policy. The effects of education on labour productivity hardly need an explanation. Yet the balanced creation of skills is a matter of time.

2. The concept of farm management is relatively new. We are unable to get relevant information which might suggest the extent of management efficiency. However,

19. Gary S. Fields, "The Private Demand for Education in Relation to Labour Market Conditions in Less-Developed Countries", The Economic Journal 84 (1974), p.915.

20. FAO Report to the Government of Saudi Arabia on Pasture Development and Range Management (With respect to increasing livestock production), (Rome 1965), p.9.

the introduction of new techniques has gradually altered the basic structure of factors of production. The composition of traditional capital, as we have shown, takes the form of ta'awun²¹. Physical capital has become significantly more diversified, and traditional labour which is firmly based on traditional bonds (such as family and asabiyya) has become more and more governed by principles of specialisation. Hired Yeminis and other labourers from nearby countries have replaced family labourers.

Such alterations, however, are in the process of adjustment. This is because the adoption of fertilizers, of new varieties of crops and of machinery have not yet been matched by basic skills which make full technical advances in agriculture possible. Transfer of technological knowledge has been affected by the internal structure and external development as well. This is because the production system, though undoubtedly changing, still retains some traditional features. The family labour unit is going to continue at least as a decision maker.²² On the one hand it has been reinforced by traditional and cultural factors, and on the other hand it is affected by the nature of agricultural production system which is

21. Supra, p. 131.

22. Field work

basically influenced by biological development and the physical conditions of the country.

But to what extent have such features affected the direction of social research? Traditional technology has been developed slowly firstly by traditional experience, and secondly by current learning. The transformation of skills from advanced nations is critical to applied new agricultural techniques. Indeed, constructive efforts have been made to create such skills by various international and private organisations. However, human factors inherited in the very structure of the farming system tends to delay the process of transfer of technology. For example, though there have been signs of a significant shift from a self-sufficient system to a more market-orientated production system, the development of effective management has been minimal.

Another illustrative example : it is relatively easy for industrial or entrepreneurial managers to improve the skills of management by inviting sophisticated experts and utilizing up-to-date managerial procedures, and consequently radical improvement in the organisation capabilities is flexible with requirements of technology. Agricultural producing units in Saudi Arabia and in most parts of the world are far from responding to technological change at the same level or at the same pace. The

cultivation of dates and of tomatoes and other vegetables in Madina could reach a high level of efficiency had the management of mechanized farms developed. This is an obvious example where, despite conspicuous agricultural commodity specialisation which signifies a phase of agricultural modernisation, the capability of agricultural technology to grow as fast as it should has been retarded by lack of efficient management. For this reason, the policy for research is rightly orientated towards a more broader base, starting from developing human competence, rather than a sharp line such as direct practices of applied agricultural techniques. For example, the administrative apparatus of the Ministry of Agriculture, College of Engineering and The Agricultural College are a starting point for future adoption of technological improvements. The shortage of specific skills is a critical problem in the adoption of agricultural techniques in advanced countries and Saudi Arabia as well. However, the former are concerned with improving and maintaining the present capabilities of the population, whereas the latter are trying to create new human competencies. An early government report (1973) stated that:

"Today, antiquated methods of irrigation have been superceded by modern pumps. This change has brought about a great increase in cultivated

area, and the growing of many kinds of vegetables and fruit has become familiar to the farmers of the Kingdom." ²³

6.3. Social and Economic Implications of The Settlement Projects

6.3.1. Long-Term Objectives for Improving Agricultural Techniques

The previous discussions of the effects of the hijra on social and agricultural development were intended to show how Saudi Arabia formulated its own institutions in an original manner.

George Rentz sums up the situation thus:

Beside a source of steady income, Saudi Arabia also enjoys a number of inherited advantages. Thanks to the long rule of the House of Saud, the fundamental institutions of the State are of indigenous growth, not imposed by alien authority. The people of Saudi Arabia are bound by ties of common descent (some, it is true are not of Arab blood, but even they have become thoroughly Arab in their ways), a common language and a common religion. To appreciate what this means, one should regard the heterogeneity of the scene in India or the Congo... Early Islam with its doctrine that all the faithful are brothers did not

favour a hierarchy of classes, and in this respect²⁴ it has continued to exert its influence in Arabia.

Examination of the Faisal Settlement Project at Haradh reveals the policy of agricultural transformation in a total approach. Among the many objectives of such a project are the following : settlement of bedouins, increase of agricultural productivity, creation of working and income possibilities, introduction of new methods of land and cultivation, training of experts to gain experience and information in all fields of agricultural science.

Naturally, these objectives are intended to increase agricultural productivity by means of application of modern science on a national level. Qatif, Jizan and the various experiment stations can be termed applied-research projects aimed at solving economic and social problems. One advantage of this approach lies in connecting agricultural science with the national problems. The SAMA report to the Government summed up the Settlement policy's implications as follows: "Bedouins to be included in the Settlement Scheme would be employed as agricultural labourers so as to be equipped with the necessary training in agricultural techniques and methods.

24. J.H. Thompson & R.D. Reischauer, eds. Modernisation of the Arab World (Toronto: D. Van Nostrand Company, Inc. 1966), p.117.

The Faisal Settlement of a part of the bedouin population in the Kingdom and raising their standard of living and social status by providing them with employment opportunities along with the land, capital and technical know-how, thus helping in their integration into the economic and social structure of the Kingdom"²⁵

However, the country has started relatively recently almost from nothing, and certain disadvantages stem from this late start. From the scientific point of view, applied research has had only a limited chance to produce rapid and decisive breakthroughs in its own agricultural science for the next Saudi generation. Shortage of an appropriate number of scientifically and technically qualified citizens is a constant constraint. Thus, developing human resources and broadening the direction of scientific research are two persistent problems. This is a typical situation of most non-industrialized countries. If a decisive breakthrough is to be obtained in the field of agricultural science, a major share of national resources should be allocated for various projects competing for funds. Of course, such plans depend on the structure of national resources and the money available. In one respect, Saudi Arabia is fortunate in possessing huge oil revenues. Obviously the present social policy

25. MAW, Water Resources Development, (Unpublished Report, 1975), p.10.

is a continuity of the goals towards hijra development, that is sedentary cultivation. Moreover, introduction of the oil industry has created migration drifts of a completely different nature, since even the hijra has touched almost every tribe and induced further migration and a strong connection exists between the villages and tribal districts.

6.3.2. Structural Transformation

One aspect of transformation policy in Western Saudi Arabia is to enhance certain socio-economic changes in traditional agriculture and to deal with the consequences of the oil economy. Governmental policy in such matters aims to create suitable conditions for appropriate technology, i.e. a set of techniques which makes optimum use of available national resources.

The spatial location of experimental stations and agricultural activities in Western Saudi Arabia are examples of the government influence on the processes of transformation. Distribution of experimental stations : development of agricultural roads and main roads which have already altered the relationship between Madina and Makka show how governmental decisions can influence the processes of structural transformation (Fig. 1.2.).

Another aspect is that such processes are an

extension and enforcement of trends which have been already introduced by the rapid development of the hijra and the traditional agricultural structure.

Subsequently, the transitional phase of traditional agriculture has coincided with the structural transformation of the Saudi Arabian agriculture in a special way. It is true that the pre-oil economic conditions made the pace of transformation uneven and gradual. But favourable economic conditions have been created by the revenues from the annual pilgrimages which have been estimated by I.B.R.D. at \$ 30 - 35 million.²⁶ Such revenues have been an influential factor in the processes of adjustment which, in fact, preceded the oil impact in such a way that structural transformation of traditional agriculture in Western Saudi Arabia has not undergone sudden change as in some parts of the country.

On the other hand, oil revenues have created a serious problem in terms of income inequality. To appreciate what this means one can contrast the incomes of those who work in government services and the commercial sector with those bedouins who gain a marginal income from traditional agriculture and have not yet experienced sustained transformation. Government policy has therefore given high priority to increasing the

26. I.B.R.D. Approach to Economic Development, p.2.

levels of income in agriculture and bedouin communities.²⁷ A contribution of settlement projects in the agricultural transformation process is the introduction of large numbers of bedouins to sedentary life, an essential condition for unskilled persons whose opportunities for work in the advanced economic sector seem otherwise remote.

To assess government policy, differentiation should be made between short-term and long-term goals. In the former much emphasis has been placed on satisfying the increasing demand for foodstuffs. The total import of foodstuffs was the equivalent of £394 m., nearly 360% more than four years previously.²⁸ In an effort to meet this problem it is planned to increase the national production of wheat from 42,000 to 250,000 metric tons in 1980.²⁹

This target can be attained by means of modernizing traditional agriculture. This will be examined later in further detail (Chapter 7). Suffice it to say here that settlement projects as a part of agricultural transformation have been carefully designed to be consistent with

27. Saudi Arabia Government, The Second Plan, early draft, (1975 - 80), p.35.

28. "Saudi Arabia" Financial Times (Monday 28, 1977), p.24

29. Al-Madina, July 1st 1975, First page.
Newspaper

an overall national policy. This is true in the recent programmes for subsidising traditional agriculture on selective basis. As an illustrative example, subsidies for both maize and sorghum have been reduced to discourage their production. As the Minister of Agriculture put it: "The relatively low subsidies of maize and sorghum are not low because their cultivation is rainfed but because we do not want their producers to compete with wheat and rice producers".³⁰ Similar measures for selective subsidies have been executed in the field of livestock.

Composition of loans granted by the Agricultural Bank show the same trends, namely, a closing of the gap between income in traditional agriculture and other economic sectors. For this reason loans devoted to capital machinery, such as engines and pumps, constitute 40.8% and loans for fertilizers and livestock amounted to 15.4%. Thus, the total loans granted in these fields, which were intended to raise low incomes, has reached 56.2% (Table 6.3). This is short-term orientated in order to attract bedouins to the settled agricultural sector.

30. Al-Madina Newspaper, No. 3397, June 8, 1975, back page.

Table No. 6.3.

Loans Granted by the Agricultural Bank according to purpose

<u>Purpose of Loans</u>	<u>1967-67</u>		<u>1967 - 68</u>		<u>1968 - 69</u>		<u>1969 - 70</u>	
	<u>Value</u>	<u>%</u>	<u>Value</u>	<u>%</u>	<u>Value</u>	<u>%</u>	<u>Value</u>	<u>%</u>
1. Engines	5,499.1	41.0	5,140.9	42.8	4,521.9	32.6	4,587.8	28.4
2. Pumps	2,360.7	17.8	1,805.4	15.0	2,024.8	14.6	1,998.9	12.4
3. Drilling, deeping and casing of wells	1,400.7	10.5	1,141.8	9.5	1,114.4	8.1	1,309.4	8.1
4. Constructions	422.1	3.2	475.0	4.0	645.9	4.7	628.0	3.9
5. Fertilizers, seeds, and shrubs	414.3	3.1	389.4	3.3	668.4	4.8	780.2	4.8
6. Livestock	486.9	3.7	522.3	4.3	1,632.9	11.7	1,706.0	10.6
7. Poultry	98.0	0.7	116.1	1.0	98.6	0.7	56.0	0.3
8. Fodder	524.6	4.0	320.1	2.7	516.8	3.7	373.8	2.3
9. Ploughing & levelling	405.2	3.1	246.8	2.0	700.2	5.1	1,234.9	7.7
10. Installation & Carriage	231.9	1.7	366.7	3.1	330.7	2.4	545.0	3.4
11. Fuel	152.0	1.1	249.6	2.1	171.7	1.3	189.0	1.2
12. Miscellaneous	1,346.9	10.1	1,225.7	10.2	1,437.2	10.3	2,725.0	16.9
Total	13,292.4	100.0	11,999.8	100.0	13,863.5	100.0	16,134.0	100.0

Source Statistical Summary, 1976, p.40.

6.4. Fostering Social Integration

Both the spread of hijra and settlement projects underlie the basic traits of Saudi Arabian policy in transforming traditional agriculture. And both are intended to influence the long-term adjustment that has been initiated internally by the government as a part of national policy for social development. Indeed, the objectives of settlement projects can be stated in a few words: Expansion of employment opportunities and promotion of equitable income distribution, especially since development in the oil industry have been accompanied by a widening gap in income earnings between the agricultural sector on the one hand and the commercial sector on the other.³¹

From a practical point of view, it is inadequate to visualize settlement projects in terms of economic criteria only. That is to say, profitability of a project along which indeed tends to be orientated towards the short term particularly in Saudi Arabia, is not a sufficient basis for assessment. For one thing huge oil revenues might endanger the positive side of the cultural heritage as well as one basic advantage of the hijra achievement:

31. I.S. Abdullah, "Industrialisation Strategies in The Arab World and the International Division of Labour " Oil and Arab Co-operation, vol. 2. No. 3 (1976) pp. 50 - 57.

namely, fostering harmonization within the various tribes and better relationships with the permanent inhabitants of the cities. An attempt has been made already to show that settlement projects are a continuation of the hijra's trends. Indeed, no national policy in the modern state can afford to ignore the fact that national economic, social and cultural needs are complementary rather than competitive. This is what we mean by the total approach for transforming traditional agriculture on a national level.

Two scholarly studies have endeavoured recently to analyse the nature of contemporary modernization processes in Saudi Arabia.³² Although they reached similar conclusions regarding both processes and achievements of the national policy in the sphere of social development, they have slightly different views with respect to social homogeneity. Cole suggests that nomads and sedentary peoples constitute a well-bounded social unit "enmeshed in a single system".³³ He deliberately used the word "enmeshment" rather than integration, because he feels that the society is already integrated. In fact, he rarely mentions the word integration, but in both the

32. Donald P. Cole, "The Enmeshment of Nomads in Saudi Arabian Society: The Case of Al Murrah", in The Desert and The Sown, Nomads in The Wider Society, ed. by Cynthia Nelson, pp. 113 - 121.

33. Cynthia Nelson, Ibid, p. 141.

title of his thesis and throughout the work, he emphasises the word enmeshment which fairly describes Al Murrah Social Organization and relations with the sedentary inhabitants. Yet at one point he explicitly states that "... The basic principles that underlie the nomads' enmeshment are present in Al Murrah Social Organization and are a part of their cultural perceptions, and as such provide material that will illuminate the basic processes at work in Saudi Arabian Society." ³⁴ Thus the enmeshment concept loses most of its applicability because it fails to include inherited cultural forces from the remote past as well as those of the present national policy.

To be fair to Cole, the word "enmeshment" derives its relative accuracy from both his conclusion and the strong emphasis he placed on three different levels of enmeshment. The only confusion which the word enmeshment conveys is the suggestion of an implicit and an explicit Saudi Arabian policy; this would disappear from his argument and could be avoided had he used the word "harmonization" to which we adhere.

The second writer, George Rentz, concerned with the same problem, rightly showed that peculiarities of Saudi Arabian historical experience, development of national institutions, the physical conditions of the country

34. Ibid

and the relatively homogeneous Arabian Society have shaped modernization policies.³⁵ Indeed, he touches on almost every important aspect of the national policy by concentrating on Islamic society and the peculiarity of the cultural traits which, he correctly states, underlie the future prospects of social policy. What make his analysis and conclusion superior to Cole's is not only his marshalling of the facts in a dynamic approach, but also his ability to combine thoroughness of analysis with serious thought. He is one of the few who have recognized that the Arabian Society has neither been isolated nor has remained static.

"at least, during the reign of Abdul Aziz, the people of the Islamic island began to become more fully aware of what was happening in the world outside, particularly in the technological field, and to take steps to catch up. Development in this sense began before the discovery of oil showing the native capacity of the Arabian people for fitting themselves into the scientific environment of the twentieth century. When a concession was granted to the Standard Oil Company of California in 1933, Saudi Arabia already had automobiles, aeroplanes and a wireless network." 36

Furthermore, Rentz is fully aware of the implications of the project schemes:

"the readiness of the government to alter drastically [notice that he is in sharp contrast

35. G. Rentz, "Saudi Arabia The Islamic Island, in J.H. Thompson and R.D. Reischauer, Modernization of the Arab World, (London : D. Van Nostrand Co. Inc. 1966).

36. Thompson, Ibid, p.119

with Cole at this point] the web of society is indicated by the seriousness with which it is investigating schemes to settle large numbers of bedouins on the land." 37

6.5. New Trends Affecting Agricultural Policy

6.5.1. New Financial Methods

In addition to the new development of the capital market where machines and equipment, especially pumping engines, are available for farmers, credit facilities have also developed.³⁸ Those who cannot afford to purchase by cash may find credit arrangements, yet any credit of this type is governed by crop prospectives. Businessmen who formerly engaged in this type of financial transaction were over-cautious and probably suspicious of the farmers' ability to pay. However, a new development has significantly weakened the position of traditional capital.

A modern financial structure has been developed further by the means of a budget which increases expenditures allocated for agricultural capitalisation. Thus, the build-up of capital through the state is a new trend which imposes sequential investments on a cumulative basis. The Second Plan has promulgated four points

37. Ibid, p.122

38. Supra. p.

aimed at agricultural transformation:

1. To increase the level of agricultural productivity, especially wheat, animals, wealth and fishing.
2. To move the labour made redundant by increasing agricultural productivity into the non-agricultural sectors.
3. To increase the levels of income among settled farmers and in bedouin communities.
4. To extend the development of water resources and management and to improve the physical environment by means of an overall agricultural reformation.³⁹

These four points shed light on the structural changes required to attain modernisation of agriculture.

Once again, the present deviation of financial methods from the traditional financial system is but one of the new trends which are undoubtedly going to weaken the long predominant position of traditional agriculture. In addition to the new development of the modern capital market, public institutions such as the Ministry of Agriculture and the Agricultural Bank have facilitated flows of modern capital into the agricultural sector. This does not simply mean however that traditional methods of finance have completely disappeared. On the contrary, private

39. The Second Economic Development Plan, early draft, p.23.

loans from relatives and intermediaries are still functioning.

6.5.2. Modern Self-financing

Examination of financial arrangements cannot be isolated from the impact of oil on the economy. Creation of capital from income and wealth has been accomplished in various ways. There are no reliable data in this connection and we are unable to estimate the number of farms financed by incomes and capital. Yet in recent years we have witnessed a growth of successful businessmen who have been motivated by the expansion of demand on agricultural products and anxious to diversify their investments. In the Western Province the modern farms tend to expand, and their own growth and their setting up of offshoot farms suggest that, without profits, neither growth nor expansion would have taken place. This does not necessarily imply that profitability has been achieved through efficiency of modern farm management. Other sources of success, namely regional and international development, are equally possible sources. Improving living standards in the Gulf States have attracted much agricultural produce to their markets. Moreover, this development has been reinforced by the general price

increase in agricultural produce on an international level. This increase has been recorded in the imported feeds bill which has more than trebled.

It is true in this respect that absolute amounts of imported foodstuffs are probably small. However, they should not be underestimated both as a new trend of modernising agriculture or as concomitant phenomena of capital formation. Furthermore, another modern form of self-financing stems from the nature of family structure. Growth of incomes in non-agricultural sectors and amenities in the main cities have attracted semi-educated and educated youths, but family ties (note here the bedouins attachment to his tribe and land to a degree which is probably unequalled in the world) tend to channel the money back to agriculture. The question is : since it is possible for farmers to get a loan from the commercial banks and the Agricultural Bank why do they finance their farms from their income? Loans from commercial banks are not possible without interest and even when these banks change the terminology from "interest" to "commission"⁴⁰ the committed Muslims among the farmers are unlikely to be taken in by any deliberate illusion. In fact they are

40. Supra, p. 135

aware that the mere changing of the name cannot alter the implication of usury.

Of course, the Agricultural Bank is an excellent alternative to obtain loans free from the sin of interest, yet both its charter and regulations are based on the strategy of the government policy.

6.5.3. The Arabian Agricultural Bank

The purpose of the Bank is to encourage:

1. Improvements in cultivation, storage, marketing, development of livestock, poultry, fisheries and forests.
2. Land reform, i.e. intensive land use.
3. Development of Water Resources.

These three points are intended to encourage modern build-up of capital. The Bank policy tends to discourage short-term loans, which are however highly preferable to most farmers. Loans granted by the Agricultural Bank through 1972 - 73 showed that the short-term loans are lagging behind the medium-term loans. Fig. No. 6.3. shows that medium-term loans absorbed the lion's share of the total granted in the course of six years. Loans on a medium basis are governed by the Charter and Bank loan conditions which have given the top priorities of loans to resources which

MEDIUM TERM LOANS GRANTED BY THE AGRICULTURAL BANK 1971-1972

Fig 61

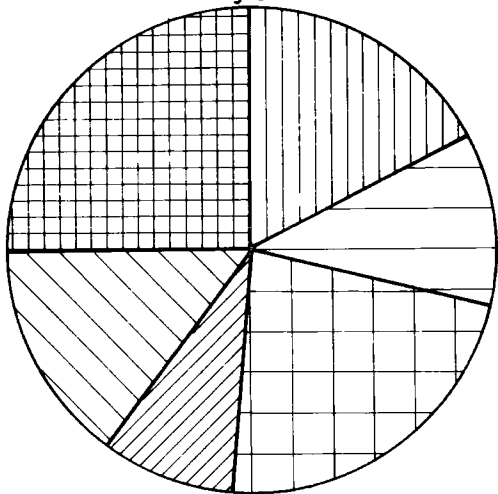
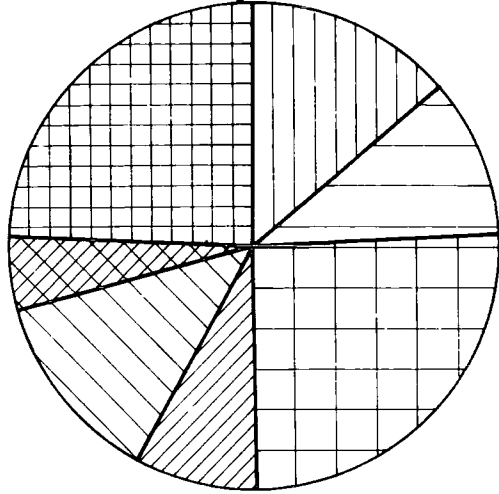
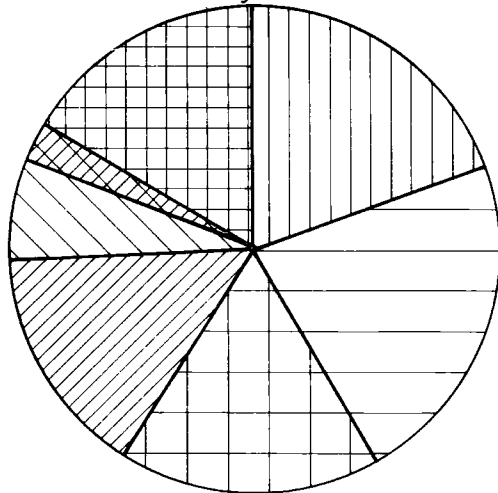


Fig 62



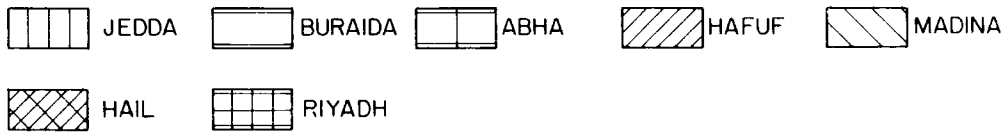
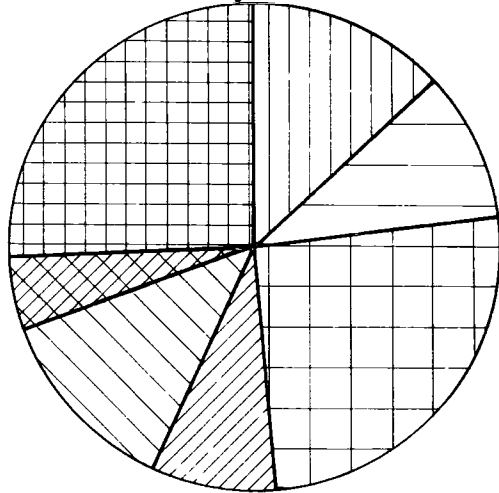
SHORT TERM LOANS

Fig 63



MEDIUM TERM LOANS

Fig 64



Source The Agricultural Bank Ninth annual report, 1974

might contribute to capital formation in the future. Thus, since investment in modern capital occurs over a relatively long period, an individual's initiative in this respect is limited by the low level of income. More important, it has meant in traditional capital that investments have tended to be short-term, unlike the Bank policy which is largely medium-term orientated. For example, loans devoted to engines, pumps, drilling, livestock and poultry constitute almost 70 per cent in any one year. But why have long-term capital loans disappeared? They have done so due mainly to a reduction in the number of large farms, determined in turn by the physical conditions of the country. Distributions of land holding reveal the fact that the size ranging from 1 to 5 dunums constitutes 49.9% of the entire area, from 10 to 15 dunums constitutes 19.8%. Thus almost 70% of holdings are small size farms. The implication of this pattern is that long-term loans are limited in a variety of ways. In the first place absorptive capacity tends to act as a limiting factor for more capital which might be financed on a long-term basis. In the second place, in the early phases of agricultural transformation, potential arable land might remain unexploited since the risk of failure is high.

These factors tend to influence loan distribution

and direction on national level. For instance, Jedda, Abha and Madina obtained more than 50% of overall lending during 1971 and 1972 as Fig. 6.1 and Fig. 6.2. reveal. Moreover, the share of Western Saudi Arabia from short and medium-term loans is 44.2% and 51.6% respectively as shown in Fig. 6.3 and Fig. 6.4.

6.5.4. Finance by Subsidies

Finance by subsidies is designed to encourage agricultural products which are unable to compete with international products. Still other reasons for subsidies have been given by the Ministry of Agriculture, namely the cost of production. Thus wheat subsidies stand at 5 piastres and rice 6 piastres whereas for sorghum they are only 3 piastres for each kilogram produced. Furthermore, demand for food has shifted to good quality of produce. These are relatively small subsidies and are intended to discourage sorghum production because their competition with wheat and rice stems from their cost which is governed by the size of the rainfall.⁴¹ Shortage of poultry in the local markets exerted pressure on the government to subsidise the poultry industry. It goes without saying that increasing poultry stock is a form of capital which is again medium-term orientated.

41. Al-Madina Newspaper, No. 3397, June 1975, back page.

This is because the composition of subsidies is consistent with the transitional nature of agricultural transformation. The four areas of subsidies are as follows: automatic cages; equipment for slaughtering and removing the skin; cages for chicken transportation; and making equipment for fodder.⁴² Moreover, there is an emphasis on loans and selective subsidies. For example from the recent Agricultural Bank figure of S.R. 800 m, loans constitutes S.R. 600 m while subsidies are only S.R. 200 m⁴³. Selective subsidies at Madina and Yunbu are aiming at certain date varieties.⁴⁴

42. Al-Madina Newspaper No. 3421, 6th July, 1975, p.4.

43. Al-Madina Newspaper No.4005, 11th June,1977, p.2.

44. Al-Madina Newspaper, Ibid.

C H A P T E R S E V E N

International Transfer of Technology
and Structural Transformation: Phase III

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Introduction

Part Two of this thesis has attempted to stress the fact that processes of modernisation not only necessitate structural transformation of traditional agriculture but also involve careful examination of both intellectual outlook toward adopting technology and the main approaches to an appropriate choice of techniques.

Moreover, in dealing with agricultural transformation in Western Saudi Arabia, neither the planners in their offices, who attempt to alter the traditional agricultural structure, nor the individual farmers in their fields, can operate without the clear approval of Islamic institutions and tradition. It is appropriate now to review the main approaches that have developed in Saudi Arabia as a reaction to the application of technology in general and agriculture in particular. Following this, we may derive a broad outline for methods of improving transfer of technology in Western Saudi Arabia.

The problems of transference of technology are examined in four sections. Cultural, geographic and economic approaches are analysed in the first three sections. Section four follows from such approaches to suggest what seems an appropriate choice of techniques. Before examining these issues the term "technology" needs to be defined. It is used to include any advance in agricultural techniques pertaining to improvement in

the production system. Thus, a wide range of agricultural technology is included covering, among other aspects, scientific research, institutional development to deal with agricultural knowledge, and the diffusion of well-established innovations such as new varieties and agricultural machinery.

7.1. Cultural Approach

The cultural approach tends to place the interlocking parts of improving agricultural techniques into a long-term perspective. The scope of such an approach includes cultural patterns, national traits, intellectual reasoning and civilisation.

Both the development and decay of Islamic Civilisation contained the main elements of modernisation. In a study of inheritance of scientific method, O'Leary rightly maintained that "there is a certain analogy between civilisation and infectious disease. Both pass from one community to another by contact, and whenever either breaks out one of our first thoughts is, where did the infection come from?"¹

Although O'Leary's interest in the way and the form in which the Greek science found its way to Arabia may appear of historic interest only, nevertheless his statement goes beyond the problems of the past to include certain vital issues in our time. For one thing his expository power and original approach to science made it clear that intellectual and practical problems are two dimensions of the same problem. This is because Islam, as a way of life, influences every-day activities and the extent to which science may be applied within them. To explain this problem various scholarly approaches have been advocated to explore the relations

1. O'Leary, De Lacy, How Greek Science Passed to The Arabs, (London: Routledge and Kegan Paul, 1948), p.1.

between cultural patterns and adoption of science. However, the experience of Western Saudi Arabia shows that there is still an obvious gap between integrating such approaches in a systematic analysis on the one hand and relating them to practical problems on the other. In an attempt to fill the gap, this chapter is devoted to two main questions:

1. How and why have the old Islamic issues become academically relevant to the contemporary student of agriculture?

2. How do the transfer of technology and the application of science involve practical Islamic problems? The cultural approach is an attempt to answer the first question, whereas the geographical and economic approaches are called upon to answer the second.

7.1.1. Adoption of Technology and Cultural Legacy

The way in which cultural patterns affect technological transfer continue to occupy a special place in contemporary Arab and Western thought. Saudi Arabia and the whole Arab World have decided to adopt western technology. There remain, however, practical problems in the decision to resolve the unsettled question of conflicting cultural patterns. In turn such a decision possesses intellectual and practical problems that might influence both the adoption of technology and the quality of life. This is because Arabian Civilisation is full of cultural heritage, both deficiencies and achievements. Arabian Culture is one of the various approaches which have been used to explain the backwardness

of Arab technology. Such an approach has given rise to a rather deterministic approach which maintains that the Arabian culture excludes any possibility of technological adoption. A fairly accurate representation of such an approach can be found in both the title and contents of a paper by Professor Charles Issawi: "The Arab World's Heavy Legacy".² He maintains that the revolution of the Arabs against western ideologies and institutions forms strong barriers against transfer of technology and economic progress. The reasons for such barriers, he argues, stem from the nature of Arab Legacy. This has a retrogressive effect on the economy, as, in his opinion, do the Ulama intellectuals. This situation he describes as essentially barren.³

If one examines the present poor status of Arab technology and absence of diversified economy one cannot afford to deny Professor Issawi's argument. Indeed, his point of view derives both its strength and its weakness from his approach to Arabian modernisation. Furthermore his full argument is neither confined to one Arab country nor contained in one single article of book.⁴ To him, it seems that modernisation is a total social and institutional process, and therefore tends to follow a universal pattern. But what are the basic assumption

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2. Thompson and Reischauer, eds. Modernisation of the Arab World (London D. Van Nostrand Co., 1966), pp. 13-14.
 3. Ibid. p. 15.
 4. The Economic History of the Middle East; Studies in the Economic History of the Middle East pp. 395-412; Papers on Islamic History, II Islam and the Trade of Asia pp. 245-267, to mention a few.

which underlie his argument? Which of these might be significant in explaining certain factors that may facilitate the transfer of technology? Apparently, this transfer depends on cultural patterns and economic factors which are both suffering from decay: "The decline of Middle Eastern trade is one aspect of the economic and cultural decay of the region".⁵ Such an argument is a powerful one. Even the agricultural sector, continued as a major source of trade, has failed to secure enough surplus to be exchanged for modern machinery which is badly needed. Richards also suggest that the lack of mechanical inventiveness of the Islamic civilisation is responsible for economic and cultural retrogression.⁶ What does this really mean? Modernisation requires transformation of culture and identity, if the indigenous cultural pattern is less conducive to economic and social development. If this is so, to that extent must and average Arabian sacrifice his values and how has the Arabian culture responded to western technology? These values may be taken to be what Ibn Khaldoun called Asabiyya: it is the form of the Arabian individuality and identity.

The world-wide spread of western technology has produced an intellectual problem: the Arab reaction to western ideas. One aspect of this is the defensible approach of most Arab writers who maintain there is nothing in their legacy against the application of science.

5. Richards, D.S. Papers on Islamic History II Islam and Trade of Asia, A Colloquium, (London: Bruno Cassirer Oxford Press, 1970), p. 24.

6. Charles Issawi, The Economic History of the Middle East, 1800-1914, A Book of Readings, (Chicago: University of Chicago Press, 1966), pp. 3-4.

Yet the connections between cultural patterns and a advancement of science has already laid Arabian culture open to various charges. The main blame is that such culture is responsible for the actual state of backwardness and tends to resist the adoption of new techniques.

Most Arab writers have either failed to grasp the difference between certain cultural causes and consequences, or have insisted on adopting polemic approaches. These in turn could add another charge in creating what can be described as an intellectual retreat. What is meant here by intellectual retreat is neither paucity of intellectual activity nor the acceptance of powerful arguments against the Arabian cultures. They have failed to develop a systematic approach which reveals the connections between transfer of technology, economic development, agricultural transformation, and cultural pattern.

Such polemic writings as these should be dismissed at the outset. They are neither able to suggest that exact connections between cultural pattern and transfer of technology nor are they conducive to the advancement of a critical system of thought.

No serious student of technological transfer can fail to notice new trends in direction and scope of research and intellectual activities where these are aimed at the exact nature of Arabia's cultural patterns and its reaction to western ideas. An example of such

trends is the work of Albert Hourani.⁷ This analyses the Arabian writers' heritage from the angle of their reaction to western technology. Indeed the book is well known, and yet the scientific basis and analytical schema through which its author has assessed the requirements of practices have not been given their due place. One major contribution lies in Hourani's attempt to relate the broad elements of the Islamic theory to intellectual reasoning concerning development issues. Another important aspect of his study is that individual behaviour, attitudes towards technological adoption have been related to and grouped around, one single theme: adoption processes of technology.

While conducting research in Western Saudi Arabia the present author noticed that farmers would decide not to invest or to cultivate, or to use agricultural pumps if such activities conflicted with Islamic traditions. Intensive indirect discussions with farmers revealed to the author that although a great deal of conservatism dominates the attitudes of farmers, yet they are by no means against adoption of new agricultural techniques.

7.1.2. Strategy for Technological Transfer and Agricultural Projects

As has been pointed out, the decision to invest in agricultural projects should be based on a total

7. Albert Hourani, Arabic Thought in the Liberal Age 1798-1939, (London: Oxford University Press, 1970).

approach where financial analysis, technical information, locational aspects and socio-economic problems should be supported by cultural considerations. Contributors to a recent book concluded that full understanding of culture is essential for the transfer of technology.⁸

Both the title and the approach of the work are highly significant. It is interesting to notice that both Hourani's conclusion and the findings of this book are the same. The former has approached the problem from a philosophical point of view whereas the latter argument is from an empirical basis.

The contributors to Man and the Future of Arab Civilisation deviate markedly from previous approaches by stressing the mutual impact between the Arabs and the industrial nations. The authors of the book reach the conclusion that certain Arab traditions and values found their way to the west. Such a conclusion is based on the experiences of the international development programmes and the results of technological transfer or even transmission. But what have such experiences suggested? The contributors listed seven factors for effective transfer of technology, ranging from appreciation and recognition of cultural values to conditions of successful agricultural projects.⁹ Successful agricultural projects, they suggest, depend on their relations with other economic programmes. In practice this means that without a well-defined national policy of science and actual co-operation with international

8. International Relations Conference for World Scientists, Man and the Future of Arab Civilisation, trans, (Beirut: American University, 1974).

9. Ibid. pp. 51-54.

agencies the chances of effective transfer of technology within such projects seem remote.

Indeed, what makes the approach of Man and the Future of Agriculture a sharp deviation from traditional thought is the questions it raises and the solutions it suggests. It shows that the Arabs have strong tendencies to retain their own culture and reject others. Despite these tendencies, however, they are prepared to adopt other cultural patterns provided that they find in their history similar situations which by analogy seem to resemble the problems at hand.¹⁰ Thus the solutions for transfer of technology should be based on the actual spirit of Arabian culture rather than on injecting other unmodified cultural patterns. In considering modernisation, it is suggested that five basic tenets should be observed:

- 1) Oneness or Unity: unity of God, unity of truth, and human unity.
- 2) Human dignity: social welfare, equality, and application of Islamic principles.
- 3) Scientific inquiries and research development through universities.
- 4) Moral values: the standard of acceptance or rejection of non-Arab Culture or technology is related to the traditional Arabian values such as respect for elderly people and the recognition of the Creator and created rights, etc.

10. International Relations Conference, op. cit., pp. 19-20.

5) Dialogue: scholarly comparisons of various cultural patterns and their relationship to the future needs and technological advancement.¹¹

The practical basis behind such recommendations have been skillfully illuminated by two eminent scholars. As Neil Chamberlain has suggested, the advancement of technology through transfer cannot be viewed as possessing some autonomous value, irrespective of the goals and values that are built into the fabric of receiving culture. It is not enough to approach the transfer of technology only with the consideration of whether it is technically feasible; it must also be appraised in the light of its social acceptability.¹²

7.1.3. Technical Feasibility Versus Social Acceptability

The relevancy and complexity which stems from the fabric of receiving culture have been dealt with in some detail by Eugen R. Black (former Director of the World Bank).¹³ "Diplomacy" in the title underlies the crucial relationship between cultural patterns and transfer of technology. Black emphasises that there must be a balance between processes of science and technology and the values of freedom. This balance must be the prime target. What he meant by diplomacy is how to transfer technology through economic development programmes without as he put it, "arousing too much hostility."¹⁴ He indicates

11. Op. cit. pp. 19-29.

12. Daniel Spencer and Woroniak Ale, eds., Transfer of Technology to Developing Countries, (London: Frederick A. Praeger Publishing, 1967), p. 150.

13. Eugene Black, The Diplomacy of Economic Development and Other Papers, (New York: Athenum, 1963).

14. Ibid., p. 3.

that technical feasibility involves a wide range of problems; "One must ask whether the construction of a power dam would meet some important objective: that is, would it provide power for a market that already exists or is it in prospect? Would it provide irrigation waters for land which can be made arable in this way and on which farmers might be willing to settle?"¹⁵

Prolonged discussion with farmers of Abha and Madina made it clear that agricultural transformation in such areas should be based on a close understanding of farmers' incentives and their active involvement in agricultural projects. Appreciating farmers' incentives includes assessing "the farm family net benefit" from the individual point of view which, of course, cannot be isolated from the well established traditional culture and traditional values.¹⁶ Another important criterion for assessing agricultural projects is that transforming traditional agriculture in Saudi Arabia as well as in the entire Arab World is considered by the planners as a road to eventual industrialisation.¹⁷

It is true that Arab policies for agricultural development vary according to the various national policies and the local conditions of every Arab nation. Nevertheless, all the Arab countries tend to co-ordinate their agricultural

15. Ibid., p. 28.

16. J. Price Gittinger, Economic Analysis of Agricultural Projects, (Baltimore and London: The Johns Hopkins University Press, 1972), p. 142.

17. OAPEC, "Seminar on Co-ordination and Industrial Development in the Arab World", Oil and Arab Co-operation, Vol. 2 No. 4, (1976): 105-114.

policies with an overall economic development.

A.I. Tannous, in his paper "Organising Science and Technology for Agricultural Development", recommended certain steps for successful agricultural programmes, especially in a transitional society:

It is imperative, therefore, that the national organisation provide for the active involvement of the people - whether villagers or semi-nomadic tribesmen- in the total process of agricultural development. Here are some steps that should be taken: 1) Involve the people by encouraging the free expression of their problems. 2) Involve the people in the planning phase. 3) Involve the people in the implementation phase. 4) Involve the people by motivating them through their own economic, social and religious values that are inherent in their patterns of culture. Moslem communities, for example, respond more readily to a project when religious precepts are used in its support.¹⁸

The "Green Revolution" in South East Asia states represents a major advance of agricultural technology and provides other countries of similar social and economic conditions with appropriate lessons. On the one hand it has increased agricultural production at a rate probably unprecedented in South East Asia agricultural history, but on the other hand it has created numerous "second generation" socio-economic problems. Hla Myint maintained that the policies required to turn the Green Revolution into a dynamic force for economic development are connected in three ways : technical, organisational, and socio-economic.¹⁹ These three areas suggest that a choice of techniques involves long-term processes and

18. Claire Nader & A.B. Zahlan, eds., Science and Technology in Developing Countries, Proceedings of a Conference Held at the American University of Beirut, Lebanon, (London: Cambridge University Press, 1969), pp. 66-67.

19. Hla Myint, South east Asia's Economy in 1970, Asian Development Bank, (New York: Praeger Publishers, 1971), pp. 5-17.

cultural adjustment.

The technical choice in Western Saudi Arabia is no exception. What has happened in Madina and Qasim is that the introduction of new machines: e.g. tractors, spraying hoses, and motor vehicles have created unemployment. That is to say, traditional labourers have been replaced by modern mechanical techniques. Input substitution in these areas has thus affected the previous prevailing conditions in both the economic aspects (income) and the social aspects (distribution of technology at the national scale). Experience in Western Saudi Arabia suggests that new techniques could be accelerated via land holding size and transportation development. As Table No.3.3 shows, the size of small holdings seems to be the predominant feature which influences degree of capitalisation, due to limited absorptive capacity. Moreover, market structure in Western Saudi Arabia tends to derive unequal benefit from application of science because remote areas are handicapped by lack of adequate transportation.

7.1.4. Technological Adoption and Islamic Teaching

The problems of transforming traditional agriculture in Western Saudi Arabia are intermixed with other problems, because the adoption of new techniques, as this study attempts to establish, requires three basic conditions: the developing of links between agricultural modernisation and national goals, the creation of sufficient adoptive capacity, and finally the taking into account of local

environmental conditions.

F. Herman believes that the transfer of technology may not benefit a developing society as it should unless local factors are taken into consideration. He goes further, stressing the fact that transfer of technology to developing nations ought not to occur directly. Research and improving local and national capacities should precede the direct transfer of technology.²⁰

Emphasis on cultural factors seems to be gaining ground in the eyes of developing nations as well as advanced states. The Minister of Planning in Egypt has summed up the strategy for efficient transfer as follows: "The transfer of technology has to be considered together with a total process of industrialisation, and the partners receiving the technology should have certain responsibilities to develop their capacity, infrastructure and the ability to adapt and create technology as a living organism in an economic and social sense."²¹ Due to different stages within transitional societies, he believes that the choice of technology has to be fitted to the situation of the receiving countries.²²

The hurdles of modernisation, as Daniel Lerner calls the situation makes the examination of culture and tradition essential for both planners in their offices and farmers in their fields.²³

20. OECD, Society and the Assessment of Technology, (Paris: 1973), pp. 19-49.

21. OAPEC, Opportunities for Cooperation between France and the Arab World, (Inst. Fracais Du Petrole: 1976), p. 88.

22. Ibid., p. 90.

23. D. Lerner, The Passing Traditional Society, Modernising the Middle East, (N.Y. The Free Press 1968), p. 65.

One advantage of the cultural approach to transfer of technology is that it leads to an appreciation of the precise nature of cultural dimension as a dynamic force in the process of technological adaptation. In particular, the relationship between science and religion must be taken into consideration. Practical issues and theoretical reasoning underlie the relationship between religion and science. In the first place Saudi Arabia has chosen to adopt economic institutions and a social system totally based on Islamic teaching. Thus the effectiveness of such institutions and individual behaviour are judged by their adherence to Islamic teaching. Islamic religion acts as a universal standard for both Arab Islamic action and thought.

The problems of transfer of western technology have engaged the minds of Islamic scholars for many years. For example, some Islamic scholars, (especially Tahtawi, Jamal Al-Din Al-Afaghani and Mohammed Abduh, have reacted to westernisation in a similar manner.²⁴ These three writers and their disciples have based their arguments on tradition and the Koran. Sheikh Tahtawi is trained in modern sciences including botany, maths, zoology and physics, and with this background he has tried to relate Koranic thought to the origins of modern science. He has maintained that the number of verses of the Koran devoted to science exceeds 750, whereas jurisprudence accounts for only 150 verses. He has analysed these issues in various books

24. Khaldoun S. Al-Husry, Three Reformers, A Study in Modern Arab Political Thought, (Beirut: Khayats: 1966), pp. 11-55.

the titles of which signify new trends in Islamic thought. As an instance in point, two of his books, The Koran and the Modern Science and Pearls of Sciences,²⁵ are devoted to showing that Islamic teaching is scientifically orientated. Sheikh Tahtawi maintains that those Muslims who are no longer Muslims, except in name, would become actual practicing Muslims once they study the Koran and its adaptable nature. During the 22 years which elapsed between the appearance of his first book and the second, his thought and his intellectual reaction to western technology underwent considerable change. His approach to the adoption of western technology in conjunction with Islamic principles conflicts with that of writers who find no such connection. This has made him vulnerable to attack from writers who have failed to find links between Islam as an ideology with rules of behaviour and Islam as an institution mainly created for human welfare and social solidarity. Unfortunately, at the time he was writing, the state machinery which might secure human welfare was suffering from inner decay and society was undergoing a rapid process of disintegration. For these reasons Tahtawi advocated prompt application of western technology after the following reformative measures in the field of education:

- 1) New methods of national education to focus upon social problems;
- 2) Creation of new attitudes towards science rather than detailed study of obsolete science;

25. Khaldun S. Al-Husry, Ibid. pp. 11 33.

3) Advancement of objective polemical approaches and emphasis on fruitful methodology and theory.

Jamal Al-Din Al-Afghani and Mohammed Abduh have followed a similar approach. Both realise the danger of economic deterioration and other social evils, and consequently have been anxious to see the application of western technology accepted. The differences between them lie in their style of thinking and in the ways of adopting western technology. Al-Afghani takes a precautionary approach: the danger inherited from Western Civilisation, he maintains, may corrupt moral and traditional values of Islamic society. He considers, however, that technological adoption is an essential course provided that actual cultural and Islamic tradition remain unchanged. This can be done, he advocates, by political means, which are able to fulfill certain social and economic ends if western technology is going to be properly accepted.

Following Al-Afghani, Mohammed Abduh believes in the role of the State in this regard he disagrees on certain fundamental issues of modernisation, yet his disagreement is a matter of strategy. He suggests that education should precede both government reformation and technological change. Indeed, Abduh holds that the educational system is not compatible with the requirements of modern science but is essentially weak and orientated towards low level training for the civil services.

The prime aim of Abduh was not only to reconcile Islam with modern thought but to revive the traditional Islamic methods of thinking. This is the one point which

unifies Abduh and Al-Afghani. Explicitly they want to adopt modern techniques in practical life and implicitly they consider that society is ill-prepared to adapt itself to modern technology. More important, both Abduh and Al-Afghani imply extension and development of the programmes for technological adoption which Tahtawi puts forward. Thus emphasis has shifted towards a proper intellectual environment which can make it possible for the average Arabian to respond positively to western modernisation.

In fact the message of Abduh had conditioned the attitudes of the Arab World towards technology in three ways:

1) As an Islamic reformer his views are not only acceptable to most Muslim and Arab people but also represent a starting point for any constructive and serious intellectual debate of technological adoption. His influence on the Arabs intellectual life is expected to continue for some time to come.

2) Abduh and his disciples were concerned about problems of their time when the Ottoman empire dominated the Arab World. Thus both their practical requirements (social programmes, type of technology and technical education) and their thinking were conditioned by unstable international situations.

3) It is clear from the above two points that although Abduh and his disciples reacted in a positive way to transfer of technology and revived and revitalised Islamic thought, they also injected the present intellectual

environment with certain anachronistic issues. However, these issues ultimately lie beyond the scope of this study.

Indeed, programmes, intellectual discussions and the press in Saudi Arabia now concentrate on several key issues. These are economic development; agricultural development versus industrial development adoption of western technology and bedouincratology.²⁶ These issues are generally measured according to economic criteria and the Islamic standard. Institutional response to technology is a central issue around which everything is grouped. Moreover, both Islamic institutions and modern technology have been considered as a means and measure of solving social and economic problems.

7.1.5. Change and Development

Professor M. Burrows endorses a cultural approach to transfer of technology. His main points are that Islamic scientists, in their Golden Age, have developed the foundation of modern science and both Islamic culture and Islamic thought have made an invaluable contribution to the foundation of modern science. On the other hand Islamic culture suffered considerable retardation and decay over several centuries. Thus those societies now find themselves far behind European nations in technology and sciences. International exchange of ideas and technology has made a mutually impact between Islamic and Western Cultures. Economic, social and political events

26. Monaf Mansour, Al-Khafj, Vol. 10 No.5 (Jan, 1976), pp. 2-7. As the term suggests, bedouincratology refers to the present debate and polemical criticism of Arabian adaptability to western technology.

have practical and moral dimensions. Furthermore, commercial and cultural exchange have brought in western goods which have contributed to social and economic progress. The new ways of life associated with them, while making such progress possible, have, however, created a new dilemma as traditional and spiritual values have been threatened by materialism and secularism.²⁷

In a systematic analysis Millar Burrows has shown how religion and science differ in their approaches towards a discovery of the truth: "Religion and Science are dealing with the same facts. But they approach the facts from different angles, which makes them deceptively
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divergent in their visualisation of the truth. Furthermore, he implies that religion orders man to act and obey whereas science involves experimental methods. The connection between theory and practice is both an old Islamic question and a serious problem for transfer of technology. Attempts have been made by Mohammed Iqbal, Harold B. Smith and others to develop an Islamic theory on key issues: reinterpretation of the Islamic principles and re-evaluation of Islamic cultural patterns in the light of modern technology.²⁹ What their works suggest is that Islamic culture is a fertile source of original ideas which are not only acceptable to Islamic communities but may also help planners in the effective application of western technology. Furthermore, Iqbal and Smith quite rightly conclude that various internal ideologies have developed within Islamic

27. Millar Burrows, "Some Suggestions Concerning the Relations Between Religion and Science in Islam" in Colloquium on Islamic Culture in its Relation to the Contemporary World, trans. (Cairo: Franklin, 1962) pp. 51-55.

28. Ibid. p. 53.

29. Ibid. p. 73.

society which, instead of revitalising Arab thought, tend to confuse any constructive intellectual endeavours.³⁰

Jalal Al-Fasi is another Arab thinker who in modern times has systematically appraised the current conflicting ideologies within the Arab world. He divides the new trends of thought into two main types:

1) those conservative views which are essentially based on old Arabian legacy and reject any other;

2) the radical point of view which visualises the proper way of regarding modern technology as a complete departure from both Arabian tradition and legacy.³¹

Al-Fasi rejects both approaches on the ground that modernisation involves change and development and according to him neither of the two viewpoints has succeeded in grasping the essence of the terms "change" and "development". He suggests that the process of change leads to technological improvement. Furthermore, he gives examples where both change and development are in the wrong directions. These are instances of Arabian changes which are merely stagnation and there are many examples of Arabian developments which are no more than retrogressive steps. His criterion for proper thought is to distinguish between 'modern' and 'contemporary'. His 'model' for adoption of western technology depends on certain conditions;:

1) Before adoption of western technology, appreciation and full understanding of the nature of

30. H.B. Smith, The Muslim Doctrine and its Bearing on Social Policy and Political Theory,

31. Alal Al-Fasi, Self-Criticism, in Arabic, (Beirut: Dar Al-Kashaff; 1966), pp. 94-99.

western technological development are essential.

2) Technological transfer tends to dictate a total approach: social and economic progress must be accompanied by adjustment of thought. Al-Fasi praised previous Islamic thinkers such as Al-Afghanī, who tried to show the connection between religion and science because they are essential for any social programmes in the Arab world. For the same reasons he attacked the contemporary social scientists who neglect these connections and described them as intellectually underdeveloped, because -- in Islamic Societies -- daily business and religion are inextricably linked.³²

7.2. Geographic Approach

7.2.1. Movements of Resources and Ideas

Transfer of technology occurs in space as well as through time. The time element is usually implied in development or decline of civilisation whereas the spatial concept is introduced to analyse and attempt to explain the patterns of modernisation. An example of this approach is the study by O'Leary: How Greek Science Passed to the Arabs. He cited two international routes which facilitated the spread of science. "The sea route where Greek influence to the Arabs has not only directly but also through India and thence through Persia. The trading activities penetrated deeply into the main cities and made such

32. Al-Fasi, op. cit., pp. 101-144.

diffusion possible. A major route was that by which merchandise landed at Yemen and was brought up by land through Hijaz to Dedan (Al-U'la) and through Yathrib³³ (Madina). The sea route to India helped the transfer of science in a similar way.

His geographical approach is significant for drawing attention to the manner in which the international movement of resources can contribute to transfer of techniques. Furthermore, he introduced the geographical concept as a dynamic factor in wealth accumulation and speeding-up of intellectual awakening. The famous "incense route" connected both Madina and Makka with the outside world. Along this route incense, frankincense and spikenard created favourable conditions for direct exchange of merchandise and subsequently of ideas.

Unlike O'Leary who confined his argument to the intellectual side Patai has broadened the base of his geographical approach to show how western influence found its way to the masses. Western influences are diffused from the town over the surrounding countryside as a consequence of the infrequent visits paid to its bazaars, cafes, banks and stores, by country people. Interaction is manifested mainly in commercial contacts between nomads and agriculturalists. The commercial contact taking place in the towns is actually threefold: the town sells the products of domestic industry; the village, its agricultural products; and the nomadic tribe its

33. O'Leary, De Lacy, How Greek Science Passed to the Arabs, pp. 98-99.

animals and animal products. Close examination of the analytical methods of Patai and O'Leary will show how academic approaches may lead to different conclusions. Both implied that geographical advantages influence transfer of technology. Both also implied the time element in the process of technological transfer, yet they differ on certain fundamental points. O'Leary seems to confine himself to the top of the pyramid to show that the process of technological transfer lies in the intellectual life. Patai, on the other hand, investigates the bottom of the pyramid concluding that transfer of technology implies a process of sedentarisation which is a socio-cultural phenomenon.

Recently Al-Wohaibi implied, though he did not stress the point, that pilgrim routes in the northern Hijaz have greatly contributed to permanent movements of resources and ideas within the Hijaz area.³⁴ Pilgrimage amounts to an annual conference, with participants keeping contact with most of the Islamic countries. Furthermore, those who stay at Makka or Madina for religious reasons bring with them new agricultural methods and new capital thus making Hijaz farmers well aware of developing agricultural techniques in other Islamic countries.

The annual gathering at Makka and Madina involves international movements of resources and techniques. Some skilled farmers have come from North Africa Arab Countries and have decided to settle in the Holy towns and to

34. Abdullah Al-Wohaibi, The Northern Hijaz in the Writings of the Arab Geographers 800-1150, (Beirut: Al-Risalah, 1973), pp. 315-337

engage in agricultural activities. Al-Azhari and Al-Shawi are two families who migrated from Morocco and Tunisia and settled in Madina in the early 1950's, and are among the farmers who apply modern agriculture techniques.

Along with these waves of immigrants came skilled labour, capital and new ideas which considerably hastened transforming traditional agriculture in Western Saudi Arabia. Moreover, the scale of international movements of ideas and techniques which was confined to pilgrimages and immigrants and international trade has been increased and accelerated through oil development. Experimental stations and desalination plants have been spread along the Red Sea at various strategic points.

7.2.2. Geography of Modernisation

Though the geography of modernisation can be traced back to regional development theory and central place theory as they originated in industrialised nations, it would seem that geography of modernisation is a new focus on the process of modernising developing countries. One aspect of its emphasis is to explain how the adoption of an infrastructure can accelerate agricultural transformation.

Furthermore, the modern geographical approach is a new trend of spatial analysis with an emphasis on the problem of transitional societies. Two examples can be cited. The Geography of Modernisation in Kenya, a spatial analysis of social, economic and political change

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by Soja and The Spatial Dynamics of Modernisation in Sierra Leone: Structure, definition and response by Siddle.³⁶ The modern approach which these works incorporate is highly suggestive for various reasons. Firstly, it introduces a framework for modernisation process and adjustment. Beyond this it raises the question of the composite impact of modernisation in terms of cultural and economic change. Secondly, it relates the geographical concept, as a tool of analysis, to the complex process of change. Change, considered as a spatial-diffusion process, includes such developments as transportation networks, growth of villages and internal expansion of cities. Thirdly, the geography of modernisation is relevant to the practical problem of developing nations. For example, Saudi Arabia is a large geographical area consisting of different regions. So a change in regional income or introduction of mechanisation in one area or urbanisation phenomena in the main cities causes changes not limited to that area alone.

A strategy for agricultural transformation in Western Saudi Arabia inevitably involves patterns of location and social organisation. Settlement programmes and hijra development are not only aimed at encouraging agricultural development but also involve locational arrangements for the allocation resources and transfer of technology; disposition of population; income distribution; infrastructure and diversifying the national

35. Soja E.W. The Geography of Modernisation in Kenya: A Spatial Analysis of Social, Economic and Political Change, (N.Y. SYRACUSE, 1968).

36. J.B. Siddle, The Spatial Dynamics of Modernisation in Sierra Leone: Structure, Diffusion and Response, (Evanston III, 1970).

economy. Bedouin and rural development have made modernisation a difficult task. King Abdulaziz responded to such problems by accelerating social integration and creating links between tribal districts, villages and the main towns. The present Saudi Development Plan lists these problems as a top priority.³⁷ Neither the present resources nor the means of planning implementation at the disposal of present planners were available to King Abdulaziz, yet he faced similar problems with personal initiative and an imaginative mind.

7.2.3. Agricultural Infrastructure

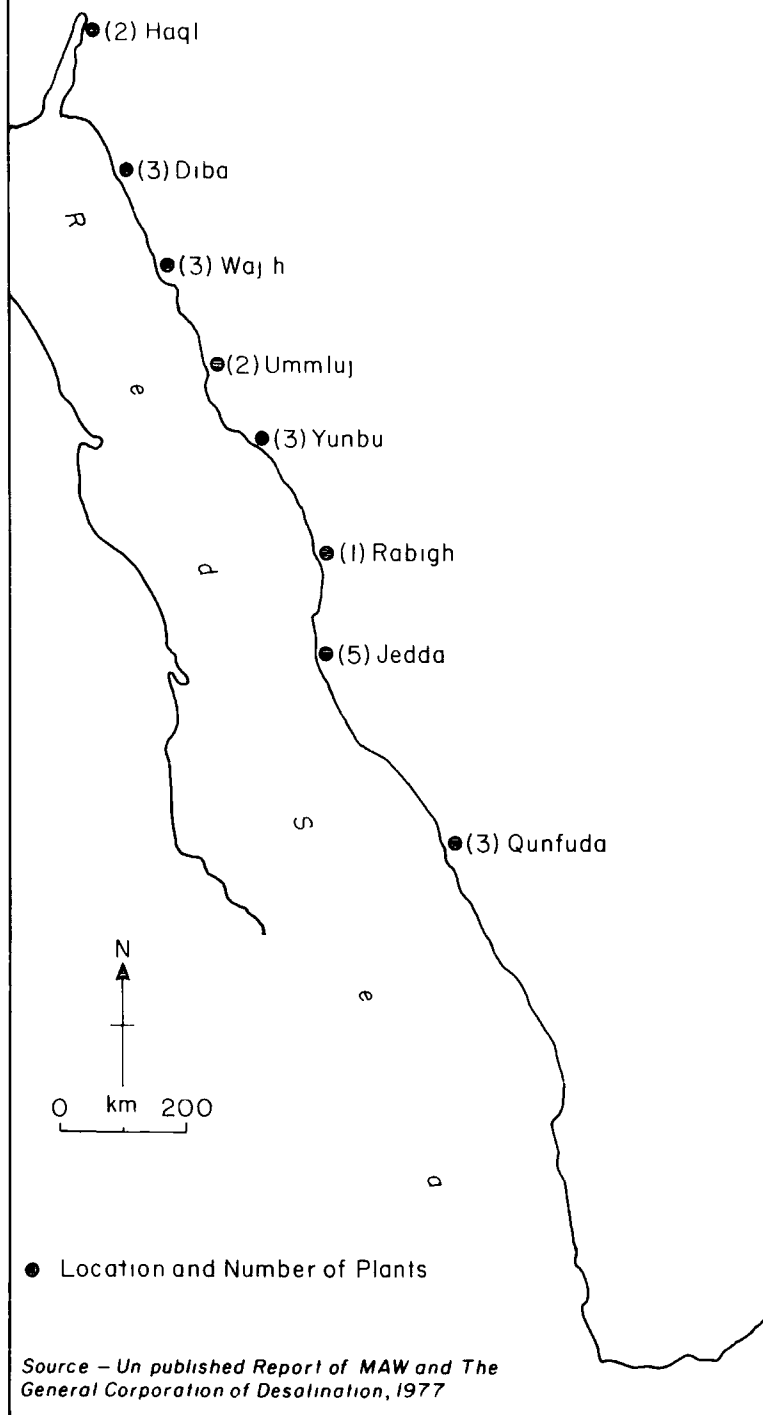
The Saudi Second Plan represents a major shift towards developing agricultural infrastructure as Fig. 7.2. shows. The distribution of dams, the digging of new wells and the increasing number of desalination plants throughout the Kingdom in general and along the Red Sea in particular (Fig. 7.1.) are examples of a strengthening agricultural infrastructure.

Agricultural infrastructure is a broad term designed to approach and analyse the process of modernisation through its basic components: transportation, dams, drainage and irrigation systems, machinery, equipment, agricultural research, soil conservation services, credit, financial and marketing institutions.

Both the spatial concept and the agricultural infrastructure focus attention on how the injection of

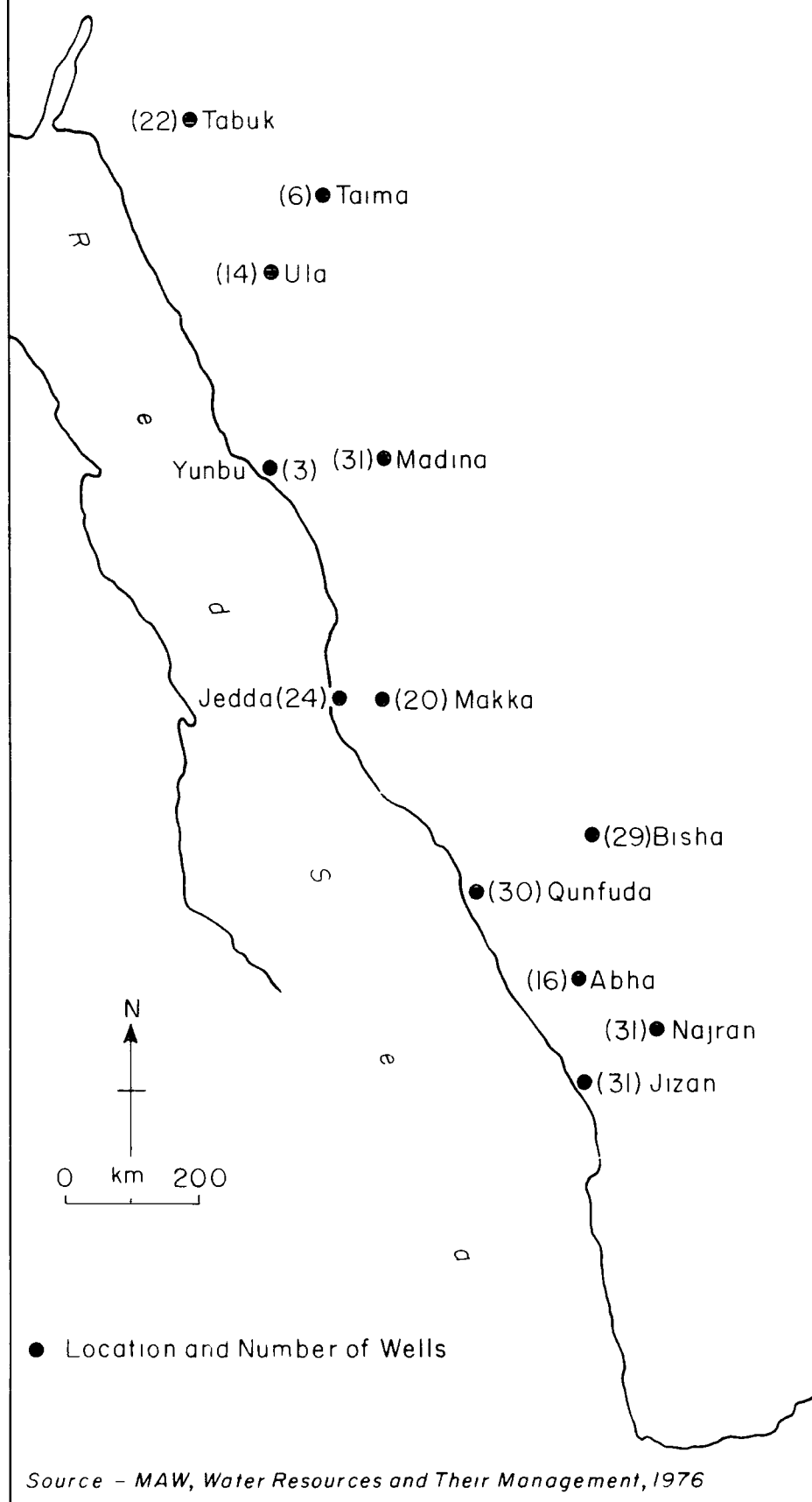
37. The Second Saudi Development Plan, 1975-1980, pp. 4-6.

Fig 71 DISTRIBUTION OF DESALINATION PLANTS
IN WESTERN PROVINCE OF SAUDI ARABIA



traditional agriculture with modern technology accelerates the process of modernisation. The spatial concept examines the composite impact of technology on the population, e.g., growth of villages and expansion of cities. For example, the introduction of technology may lead to agricultural commodity flows from the villages to main cities (such as Madina and Jedda) and also to labour migration. The spatial approach tries to establish city-village relationships to show how the various areas of the country are linked. The association between population clusters and the development of industrial production tends to explain "how" transfer to technology affects the level of agricultural techniques and "why" one technological strategy is more effective than another. The approach via agricultural infrastructure reasonably provides a sufficient foundation from which to consider a particular problem such as canals, irrigation systems and transportation facilities. In this aspect agricultural transformation is usually linked with the development of agricultural infrastructure. The practical implication of infrastructure lies in the links between various modern agricultural techniques. For example, the Jizan Dam project involves capital intensive investment and constant expenditure in the form of maintenance and sequential projects, such as electricity generation. These may be considered as essential to the existence of normal infrastructure. What this really means is that agricultural research and effective follow-up are essential activities in the setting up of basic infrastructures. They are also important elements in transfer of technology if the

Fig72 EXPLORATION STATIONS FOR
UNDERGROUND WATER



Saudi Arabian agricultural transformation is going to be a natural consequence of effective incorporation of new technologies.

The geographical approach i.e. spatial derives its importance from the fact it tends to be practically orientated towards specific problems instead of certain major social and economic theories which assumed that both human behaviour and output can be geometrically explained (e.g. behaviour according to geometrical shapes). To quote Gilbert F. White: "Upon the complex of physical environment and culture which the Arid Zone thus comprehends, several problems persistently present themselves to the geographer. Without solutions to them we can neither fully understand the past course of resource management in the zone nor build the groundwork for intelligent planning of further action."³⁸ Among the several major problems he mentions are the decisions to invest and the criteria to assess the resources. Within the field of projects such as concrete retaining dams, deep wells and afforestation, resource assessment depends much on conditions typical of the arid lands which incorporate high risks and uncertainty.³⁹ An appraisal of alternative investment involves an assessment to discover social guidelines for proper investments and the quality of complementary measures reaching deep into the social fabric and economic process of the community involved.⁴⁰

38. E.S. Hills, Arid Lands, A Geographical Appraisal, (London: Methuen & Co. Ltd: Paris UNESCO, 1966), p. 29.

39. Ibid. pp. 15-16.

40. Ibid. p. 30.

7.2.4. International Organisations and Infrastructure Development

Developing agricultural techniques in Western Saudi Arabia, as in any part of the developing world, is unlikely to materialise without the active participation of international organisations. Furthermore, there are certain technical problems which lie beyond the abilities of Saudi agricultural institutions to deal with. This is one of the main reasons why the Joint Agricultural Research and Development Project with the University College of North Wales has become a practical necessity. Joint projects are a relatively new trend in international co-operation. An outstanding example is the Harvard Tunisia Project, where the University has conducted research since 1964 to explore the relationships between economic development and infrastructure.

But what does this really mean in terms of economic development? Technical change has been extended beyond the traditional notion of increasing agricultural productivity in the short term to the recognition of social aspects. This is because the international transfer of technology tends to be applied to all sectors of the Saudi Arabian economy, and, more important, this total approach has created favourable conditions for undertaking scientific research which is relevant and related to Saudi's national problems.

Charles Mathews m"The Scientific Research in

Saudi Arabia"⁴¹ specifically described a new approach to scientific research which can make transfer of technology effective and related to the pressing national problems of the developing countries. His main points can be summarised as follows: inadequate perception of the Arab problems in general and Saudi Arabia in particular have resulted in a defective approach to scientific research which has failed to consider local conditions.⁴² An alternative approach to Saudi Arabian scientific research, Matthews suggests, therefore, involves the drawing up of new geographical maps which avoid misleading locational names and which specify locations precisely, and which incorporate in addition the fruits of a more generally broadening scientific research.⁴³ Furthermore, his starting point is that the Exploration Department of ARAMCO faced practical difficulties in producing accurate and up-to-date maps, classification etc., which is an essential basis for scientific research and agro-industrial development. Indeed, he enumerated several practical problems ranging from the investigation of dunes, tree and plant varieties, to the tribal structure.⁴⁴

Yet, the significance of the questions he raised, and the solutions he suggested have sprung logically from his total approach of adequate scientific research. Transfer of technology and agricultural change, as he

41. Colloquium on Islamic Culture, op. cit. pp. 456-485.

42. Colloquium on Islamic Culture, p. 461.

43. Ibid., pp. 456-457.

44. Ibid., pp. 463-464.

rightly sees them in his total approach depend on legacy, culture, social and an overall economic development. Thus he deliberately combined the three approaches: culture, geography and economics, into one single theme. For one thing the relative contribution of agricultural and oil industrial growth to economic development of Saudi Arabia are a consequence of transfer of technology.

7.2.5. Joint Research For Developing Agricultural Resources

To develop effective agricultural research and full understanding of local conditions joint research programmes should be maintained not only in Western Saudi Arabia, but also over all the provinces of Saudi Arabia. The international transfer of technology is mainly aimed at developing agriculture and stimulating economic growth. A great diversity of technical assistance, various agricultural and fishery programmes, and training of Saudis for scientific research are all aimed at specific targets. Economic development is one of them because of the organic nature of agriculture in the process of economic growth. This fact has been advocated by FAO and IBRD experts for the obvious reason that, without accelerating economic development and increasing the production of food and raw materials, both international trade and transfer of technology are unlikely to develop. One strategical approach for such connected problems is to develop the Saudi technological

capability. For these reasons strategy of transfer capacity in Saudi Arabian agriculture is based on continuous co-operation between Saudi institutions such as the Ministry of Agriculture, the Agricultural Bank and the basic scientific research organisations and international organisations such as Ital Consult, IBRD, STANFORD and UCNW. Acquisition of agricultural technology has already initiated the essential foundation in a variety of ways: dam construction in various parts of Saudi Arabia has been planned by international firms and built by Saudi Sub-contractors. Most employees are Saudi (including some engineers and other technical staff) as is all the considerable investment.

Despite such tremendous investment devoted for this purpose in the Second Plan, however, both Saudi planners and financial analysts have expressed little hope that such investments will produce immediate results. Investment gestation of this nature is long-term orientated and the sequential investment of basic scientific research, such as experimental stations and soil classification, has never been intended to make a dramatic increase in the immediate future of agricultural productivity. The basic function of consultants, as the French Sixth Plan rightly emphasises, is to give thought to strategies needed to optimise investment in all its forms. This is one way of relating economic development to agricultural scientific research; in fact pamphlets and reports of international organisations working in Saudi Arabia usually explain the various aspects of agricultural

research. Nevertheless, one can hardly find a systematic analysis of the way in which such international organisations have fostered the basic scientific research or transfer capacity. One reason is because the concepts of "know-how", "know-what" and perhaps "know-why" have been rightly interpreted as forms of international transfer of technology, but such concepts have been intended to explain the immediate impact on factors of production instead of explaining the links between science and production agents in the long term. This is what makes the economic significance of transfer of technology a matter of appreciating the connective elements between application of science and agents of production.

However, to emphasise the links between transfer of technology and the Saudi agricultural transformation may not result in immediate improvements in agricultural output because the country's economic development is in a transitional state, which in turn is governed by application of science and its time lag. The present study has tried to show that, although the process of Saudi Arabian agricultural transformation was initiated by hijra, the process of adjustment lagged behind until the 1940's. Moreover, slow transformation continued until research and transfer capacity became part of the national agricultural policy. Therefore, in order to appraise the prospects of such policy two elements of technological change should be considered. The first is the extent to which scientific research is relevant to pressing national

needs, (especially adequate water supplies). The second is the co-ordinated research by international organisations or teams and national institutions. The latter strengthens the transfer capacity where the farmer has influenced the direction of scientific research.

Financial allocations of the Second Plan 1975-1980 show that water and desalination are one of the highest priorities (\$10 billion). Various desalination plants have been constructed. Five desalination plants with different capacities are at present generating, and ten new plants are under construction. More important, in the Second Plan, the number of the proposed desalination plants has risen to 32 with a corresponding by increased output. These desalination projects will be integrated under one authority; the General Desalination Agency.⁴⁵

The main reason behind the integration of the various desalination stations is the changing pattern of demand, arising from the drift of people from rural areas to the cities. Shortage of water supplies have therefore been badly felt, while the demand for electricity has increased at a faster rate than expected. Thus, functions of the General Desalination Agency are not confined merely to the increased water supply. Electricity generation is another of its main functions. Both the changing internal structure of this agency and

45. General Desalination Agency, (Jedda, 1975), Unpublished report

the expanded range of its activities are obvious examples of the degree to which Saudi Arabian institutions are incorporating broader knowledge. One direct contribution to agricultural transformation is a mitigation of the country's physical constraints imposed by the shortage of water supply and another advantage of transfer of technology in this field takes the form of increasing the stock of knowledge.

One disadvantage facing Saudi Arabian economic development and agricultural transformation (which also faces many transitional societies) is the fact that the country has come late to application of science. At this stage transfer of technology is basically limited to practical problems such as the fighting of plant diseases, building dams, soil classification and experiments with various plant and livestock varieties. Again in such areas of scientific research the fund of knowledge has increased, yet, from an economic point of view, the country still at the stage of consumption of science, until the transfer capacity makes it economically feasible for agricultural institutions to explore new fields of knowledge, not only in Western Saudi Arabia, but also in other analagous regions with similar environmental conditions. To achieve these national goals it is vitally important to build a bridge between agricultural research institutions in Western Saudi Arabia and specialised international organisations, such as joint research programmes.

7.3. Economic Approach

The recent economic development in Saudi Arabia is, in two ways, a major event in the transference of technology within the field of agricultural development. As a result of technological innovations the agricultural sector has lost some of its traditional characteristics, and economic structure has radically changed.

Literature on the implications of oil in various fields of socio-economic agricultural sciences has grown since the discovery of oil, but again what strikes the student of agriculture is an absence of a systematic analysis of transfer of technology of which oil itself is a concomitant. So the question arises as to how the transfer of technology has developed in the Saudi Arabian agricultural system and in what ways can technological transfer contribute to agricultural transformation. If Saudi agriculture is to mitigate the uncertainty of the future of oil in Saudi Arabian experience, three types of technological transfer are suggested.

7.3.1. Material Transfer

The way in which technological transfer is manifested has been shaped by the stages of economic developments. As has been implied in the previous chapter on the hijra, introduction of technology has progressed in various phases. Engines, pumps and fertilizers represent an international material transfer. Indeed, machinery and equipment of this nature are an obvious material transfer of technology which -- particularly

in the early stages -- render a great contribution to agricultural transformation. Whenever listed in the government documents or those of an agricultural bank, and even sometimes when it is referred to by certain writers, it indicates mere sale or importation of machinery and equipment. This is, however, really only part of what it implies. When technology is considered in its international context, the demand for technology in developing nations is met by supply from industrial nations. The question then becomes: what type of market for technology is going to develop? The importance of understanding the implication of material transfer lies in its relevance to the transitional society of Western Saudi Arabia where the development of demand for seeds, machines and modern techniques is an essential condition for the successful transfer of technology.

For economic reasons demand for such material is changing and unstable. Saudi agricultural reports showed a shift from the purchase of engines and pumps to that of fertilisers and seeds. Loans granted during 1967-68 for engines and pumps constituted 57.8% of the total loans, whereas such loans entirely disappeared after 1972/73 as tables No. 7.1, 7.2, and 7.3. reveal. Such shifts underlie a new market development for machinery and equipment which never existed before. What this means in terms of international transfer of technology is that agricultural transformation has marked the first phase of modernisation.

Table No. 7.1.

Loans Granted by Branch of the Agricultural Bank at Abha

According to Purpose, 1972/73

<u>Purpose</u>	<u>Value in S.R.</u>	<u>%</u>
Seeds	26,300	5.1
Fuel	1,300	0.2
Training	474,600	92.3
Credit	2,385	0.5
Local Fertilizer	9,600	1.9
Total	514,185	100

Source: Ninth Annual Agricultural Report, 1974 (in Arabic),

p. 40.

7.3.2. Professional Capacity

This phase is usually loosely described as "know-how". For the purpose of this study the term "know-how" is too imprecise because agricultural transformation in general and in Saudi Arabia in particular embraces a wide range of modern technology. This range raises the question of appropriate technology and relevant application of modern science that is really a question of sequence of development. Although this issue will be elaborated towards the end of this chapter two main parts can be made here. First, Saudi agriculture as a whole is still suffering from the lack of skilled labour, and the adoption of technology requires a reliable disciplined labour force. Secondly, the Saudi farmers' adaptation to a systematic application of agricultural techniques involves trials either on experimental stations or as 'trial and error' in the farmer's own fields.

Distribution of loans from the Saudi Agricultural Bank suggests that government strategy is aimed at the development of professionalism. Careful examination of individual bank loans may give a deceptively contrary impression. For example, the medium-term loans for trucks only reached 25.1% in Barardah Branch, 6.2% in Abha and 3.3% in Jedda, which means that the demand for such items has varied with the local needs of the various provinces of the country. Even the development loans for training differ widely. They reached 92.3% in Abha; 80.7% in Jedda and 41.2% in Madina as in Tables 7.1; 7.2 and 7.3. respectively.

Table No. 7.2.

Loans Granted by Branch of the Agricultural Bank at Jeddah

According to Purpose, 1972/73

<u>Purpose</u>	<u>Value in S.R.</u>	<u>%</u>
Fertilizer	2,950	0.5
Seeds	51,734	9.3
Fuel	49,610	80.7
Trainings	446,626	0.5
Credit	2,720	
Total	553,640	100

Source: Ninth Annual Agricultural Bank Report, 1974, (in Arabic),

Analyses of the distribution of loans gives fair indication of the growth of Arabian demand for modern agricultural techniques, whether in the form of material equipment or of the development of skills. The distinction between transference of equipment and the transference of skills is vitally important for the evaluation of effective technological transfer and its impact on the modernisation of Saudi Arabian agriculture, of which it forms a phase. Furthermore, material transfer and professional capacity signify a new phase in modernisation processes.

7.3.3. Transfer Capacity for Long-Term Development

What is meant by transfer capacity is a wide range of technological adoptions on a national basis. It includes experimental stations, soil classification at the regional or national level, and other scientific research.

Land and Water Surveys on the Wadi Jizan are an illustrative example of such a wide range of activities which range from hydrological surveys of surface and groundwater to socio-economic aspects of agronomy. Such a broad field of agricultural research indicates the problems involved. Firstly, development of human resources is a crucial factor because the specialists needed to participate in various agricultural activities are virtually lacking. Secondly, economic development of the country has created, as shown previously, new demands for training specialised technicians. Pervasive underutilisation of the capacity of the Saudi labour force is a serious deterrent in the modernisation process.

Table No. 7.3.

Loans Granted by Branch of the Agricultural Bank at Madina,

According to Purpose, 1972/73

<u>Purpose</u>	<u>Value in S.R.</u>	<u>%</u>
Seeds	300	0.1
Fuel	22,964	11.1
Trainings	85,150	41.2
Credit	1,210	0.6
Poultry	1,350	0.7
Fodder	2,400	1.2
Miscellaneous	93,350	45.1
Total	206,724	100

Source: Ninth Annual Agricultural Bank Report, 1974 (in Arabic),
p. 43.

One immediate remedial measure, therefore, would be to train research personnel to carry out and interpret their own scientific and technological research. The composition of the scientific team of University College of North Wales is a case point. Agronomists, chemists and animal production specialists have been jointly and continuously involved in strengthening the foundations of Saudi Arabian national capability for research and planning. The establishment and development of facilities at the research centre, the enrichment of the library with up-to-date scientific journals and periodicals and the introduction of laboratories and routine analyses have undoubtedly made a solid base for assimilation of technology.⁴⁶ This is because the scope of projects such as the UCNW scheme has covered a wide range of agricultural research, has progressed by stages, and is most relevant since it incorporates local problems. Furthermore, research on animal and forage production has investigated how the development of animal wealth requires a national strategy based on new agricultural techniques, mechanisation and veterinary practices. The experiments conducted by UCNW showed the growth rates of Najdi sheep and the increase of forage yields with modern methods is highly encouraging. Comparison of five cereal species and sown forage production is another example of the manner in which the transfer of scientific knowledge can contribute to increasing production of agricultural resources in a variety of ways.⁴⁷

46. The library contains 455 vols. and 95 Scientific Periodicals, UCNW Report for 1971-72, p. 2.

47. UCNW, Ibid

Transfer capacity in these areas made the professional Saudi aware of the extent of adaptable technology. In particular, work has been carried out on analysis of the chemical composition of the local alfalfa to estimate the results of application of imported chemical fertilizers and the effect of phosphate and potash on yields of sorghum, alfalfa and other forage crops.⁴⁸ The point here is not simply to enumerate the functions of international agencies or their efforts to transform traditional agriculture. The main aim is to explain that such efforts are necessary to build new foundations for a scientific and technological system mainly directed at overall national problems. For one thing, transfer capacity is intended not only to create efficient use of natural resources but is also to create local scientific capability.

What the experience of Saudi Arabia suggests in agricultural transformation is that transfer of technology involves the introduction of a new imported input consisting of equipment, machinery, new varieties and the need for long term personnel training to create favourable conditions for transfer capacity. Thus, international transfer capacity is one of the most effective means for transforming traditional agriculture in Western Saudi Arabia. The introduction of new techniques implies the creation of skillful management, the more efficient use of resources, new irrigation methods

48. Ministry of Agriculture and Water, Agricultural Development, (1976), pp. 15-17.

and, most important, the development of new agricultural institutions to experiment with new techniques and to train people in their application. The Ministry of Agriculture, the Agricultural Bank and the Desalination Agency have undergone rapid structural change in both size and functions in order to keep pace with recent improving agricultural techniques.

7.4. Choice of Techniques Suggested by the Various Approaches

The organic nature of factors of production has contributed to the various approaches for transfer of technology. Moreover, the structural transformation of traditional agriculture involves a total approach broad enough to include land, labour, capital and traditional co-operation.

7.4.1. Implications of Agricultural Strategy in Western Saudi Arabia

The choice of techniques should be planned at two levels: general (i.e. in the context of national problems), and particular the first level is essential for a correct understanding of the processes of agricultural change, whereas the second level, though provincial, is important not only to show the type of agricultural problems but also to make local problems practically related to an overall national programme. Such factors are necessary conditions for appropriate choice of techniques.

King Abdulaziz's early strategy of hijra programmes and the present government efforts are trends underlying the tempo of agricultural transformation. Neither King Abdulaziz nor the architects of the present Saudi Development Plans seem committed to one single approach. Yet one can hardly fail to recognise that cultural, geographic and economic approaches are all taken into account in one form or another. For even though there is no mention of the words culture, geographic or economic, they are nevertheless implied and acknowledged.

The rapid extension of hijra programmes has remarkably combined these approaches in one, via three paths: the selection of appropriate locations for hijra settlements, the alteration of the bedouin economic structure and encouraging specialisation in traditional agriculture.

The same remarks can be said with respect to the choice of techniques in the present Saudi Arabia development. Careful study of the First and Second Development Plans reveals that agricultural strategy in Western Saudi Arabia is not orientated merely to increasing immediate agricultural productivity in the short term. The prime target is to accelerate the processes of social modernisation by means of various approaches of agricultural development.

To achieve these goals the government has adopted the choice of techniques that has been recommended by

Stanford Institute. The recommendations include, among other things, "developing range experiment stations; demonstration ranches; strengthening national institutions for producing qualified range offices to work directly with the bedouin in applying modern agricultural techniques".⁴⁹

Criterion and choice of techniques in Western Saudi Arabia tend to follow the same principles, i.e., social development programmes in various locations in proximity of Madina within the framework of national projects.

The location of projects used to be determined by the extent of existing water resources. However, since the existing or proved water resources are no longer adequate for further agricultural expansion, the strategy for choice of techniques has shifted from utilising such proved water resources to the creation and development of new ones. The planners realised that social development is remote unless favourable conditions in old as well as in new villages are created. The implementation of these goals has compelled the planners to allocate a substantial amount of money in the present plan for "detailed investigation for domestic water supplies in a circular area around Madina".⁵⁰

Another determining factor in choice of techniques

49. Stanford Research Institute, Summary Report-Essentials of an Agriculture Development Plan for Saudi Arabia (Confidential Report), (Menlo Park, Calif. January 1971), pp. 18.

50. The Second Economic Plan, (Jedda-Makka-Taif Water Supply Studies), p.39.

lies in the government strategy for income distribution. This strategy has been stated in the preface of the Second Plan: "Agriculture in its various forms is the means of livelihood for a large portion of the national population. Moreover, because of its contribution to meeting consumer requirements, it is a key factor in securing the Kingdom. Yet its potential has never been fully developed. As a consequence the rural community has not received an equitable share of the benefits flowing from the economic and social progress of the Kingdom, while at the same time the nation is becoming more and more dependent upon imported food."⁵¹

The organic nature of factors of production has contributed to recent development of various approaches for transfer of technology. Moreover, this study has revealed that the structural transformations of agricultural development in Western Saudi Arabi involves total approaches broad enough to include land, labour, capital and traditional co-operation.

7.4.2. Land Expansion

Detailed examination of environmental problems, clarification of terminological confusion of land concepts and developing a criterion for land appraisal in the context of locational and Islamic variables may seem to the reader, as to the present author, fundamental necessities for appropriate choice of techniques.

51. Saudi Arabia Development Plan, 1975-1980, p. 14

The small size of land holdings in Western Saudi Arabia stands out as an immediate problem in any choice of techniques. The cultural approach tends to direct attention to the Islamic institutions. Some scholars have advanced the argument that the reason for the smallness of land holdings lies in Islamic law which, they argue, determines the land division and subdivision through the Islamic heritage system. One advantage of the cultural approach is that, if empirical evidence supported this argument, then the various forms of land tenure system should be reviewed in order to encourage Islamic land tenure systems appropriate to application of new techniques. Moreover, if further studies confirm the author's argument, remedial measures for small land holdings should be sought via geographic and economic approaches, i.e., infrastructure development and economic inducement.

Small land holdings in Western Saudi Arabia suggest that a choice of techniques requires two fundamental strategies: land development and land expansion. The former can be done through encouraging private initiative while the latter may be achieved through firm governmental action in the area of infrastructure. Some uncultivable land may be utilised for livestock when strict application of hima system becomes effective in the various wadis of Hijaz. FAO reported that "hima were established throughout the mountain sections of Western Arabia, extending from the Yemen frontier up north to Madina and perhaps even further".⁵² This report continued to record varieties

52. Pasture Development and Range Management, Report to the Government of Saudi Arabia, (Rome, 1965), p. 13.

of hima and supports the revival of traditional techniques.

7.4.3. Labour Development

Choice of techniques that may achieve the objectives of the Second Plan can be dealt with on three fronts. First, more efforts should be made to create balanced relations between settled and bedouin populations. Particular adjustment should be made in the northern and southern areas of Hijaz where percentages of bedouin reach 76.0% and 77.4% respectively. These figures, if contrasted with the settled population of Madina and Makka; 24.5%, 5.3%, reveal the wide gap between the settled population, who may enjoy high income and employment opportunities, and the bedouin who are still practising traditional agriculture with low incomes and probably seasonal jobs. The phenomenon of seasonality in Khayber and other cultivated areas such as Wadi Fatima and Al-Figrah may suggest the type of strategy and adjustment policy which induces additional labour to both the agricultural sector and industry. One way to achieve rapid inducement of labour force is to utilise the traditional gathering areas in Western Saudi Arabia as hijra districts in order to replace seasonality employment with permanent jobs. Secondly, control over circular migration should be established. This type of migration which dominates north and south Western Saudi Arabia should be discouraged or modified. Encouraging traditional co-operation and linking such traditional techniques with land development seems a key solution for enhancing

private initiative. Thirdly, rapid expansion of employment and creation of more opportunities depends on modification of attitudes to work. Training unskilled workers among the bedouin expanding villages can accelerate the rate of growth of the labour force more than the projected rate, i.e. 3% (Table 6.2.).

The structure of population from which the agricultural labour force is expected to emerge is undergoing transition, taking the form of gradual urbanisation and rural settled population, as Fig. 1.4. shows. Education is one strategy to increase and encourage additions to the labour force in agriculture. The present Saudi Development Plan shows that money allocated for education exceeds any other item except defence. Yet a distinction must be made between education geared toward intellectualism and agricultural education aiming at the creation of agricultural technicians and skilled labour. The former is hardly effective for application of modern agricultural techniques whereas the latter is a dynamic factor for transforming traditional agriculture.

7.4.4. Development of the Agricultural Financial System

The Agricultural Bank reports for 1972-1973 show that the growing volume of loans and credit is intended mainly to allow farmers to gain access to modern agricultural techniques. Statistical analysis of aggregate credit over a period of nine years clearly shows tremendous growth in the number of loans; from

714 in 1964-1965 to 4477 in 1972-1973 . The credit structure meanwhile has shown a bias in certain regions to short-term credit instead of long-term credit which indicates the direction and orientation of the Saudi agricultural system. For one thing, economic development has created conspicuous consumption never realised before. From the economic point of view this is a serious drain on foreign exchange as reflected in the importation bill (Table 3.1.).

Developing the financial system by the government is a vital step for transforming traditional agriculture, yet due to the small size of holdings that dominate Western Saudi Arabia any financial arrangement through the national institutions is never perfect because the absorbative capacity of small holdings may not justify distributing a large quantity of money among scattered small plots. Small holdings would seem to be better serviced by private means. The cultural approach reveals some weakness on the part of the private sector to generate sufficient savings. An immediate step to discourage individual tendencies to extravagant consumption is needed if the ability of small farmers to finance their farms is going to be developed.

Another related problem suggested by the cultural approach is the question of usury, which is strictly prohibited by Islamic law. Nevertheless, it would seem that Islamic teaching alone is not enough to protect the small farms from the burden of usury debts. It is true that such illegal practices are confined to the major

towns of Madina, Makka and Khayber, and even there to a limited number of farmers. One cannot, however, rule out the possibility that usury is developing in other parts of the Kingdom.

One way to eliminate such social evils is to strengthen the financial system by creating new links between the Saudi Agricultural Bank and the co-operative farms which are growing rapidly in most of Western Saudi Arabia. The geographic approach provides practical solutions for choosing the appropriate locations and, more important, the directions in which the infrastructure is going to be strengthened.

7.4.5. Capitalisation through Infrastructure

The prevailing agricultural conditions in Western Saudi Arabia that have been examined in this thesis suggest two main approaches for appropriate choice of techniques. The first is by improving the present traditional techniques which are conditioned by the nature of the labour force, and creating favourable conditions in the growing villages in various areas of Western Saudi Arabia. These developing areas are mainly based on the mechanically pumped irrigation system, and this trend should be strengthened in the future by selecting growth points in Wadi Al-Hamdh and Al-Figra that have already attracted many farmers in the recent years. Secondly, though the spread of desalination stations, along the Red Sea represents a good foundation for applications of western technology, (Fig. 7.1.), no planner in the Saudi

Arabian government can ignore the practical implications of infrastructure. The sequential nature of infrastructural development and the range of choice of techniques within traditional agriculture. The former constitutes a technology which is available in western nations and can be imported by the government, while the latter is made up of deliberate efforts to improve the traditional factors of production: land, labour, capital and traditional co-operation. The spread of exploring stations for underground water in Western Saudi Arabia (Fig. 7.2.) is helping to change traditional agricultural structure in two ways:

Firtly, the author noticed that some remote grazing areas in north Madina were deserted until the 1960's for lack of adequate water for livestock. However, after the introduction of new wells by exploring stations, the situation changed. Resumed use of such areas took place on two levels, i.e., grazing and cultivation practices.

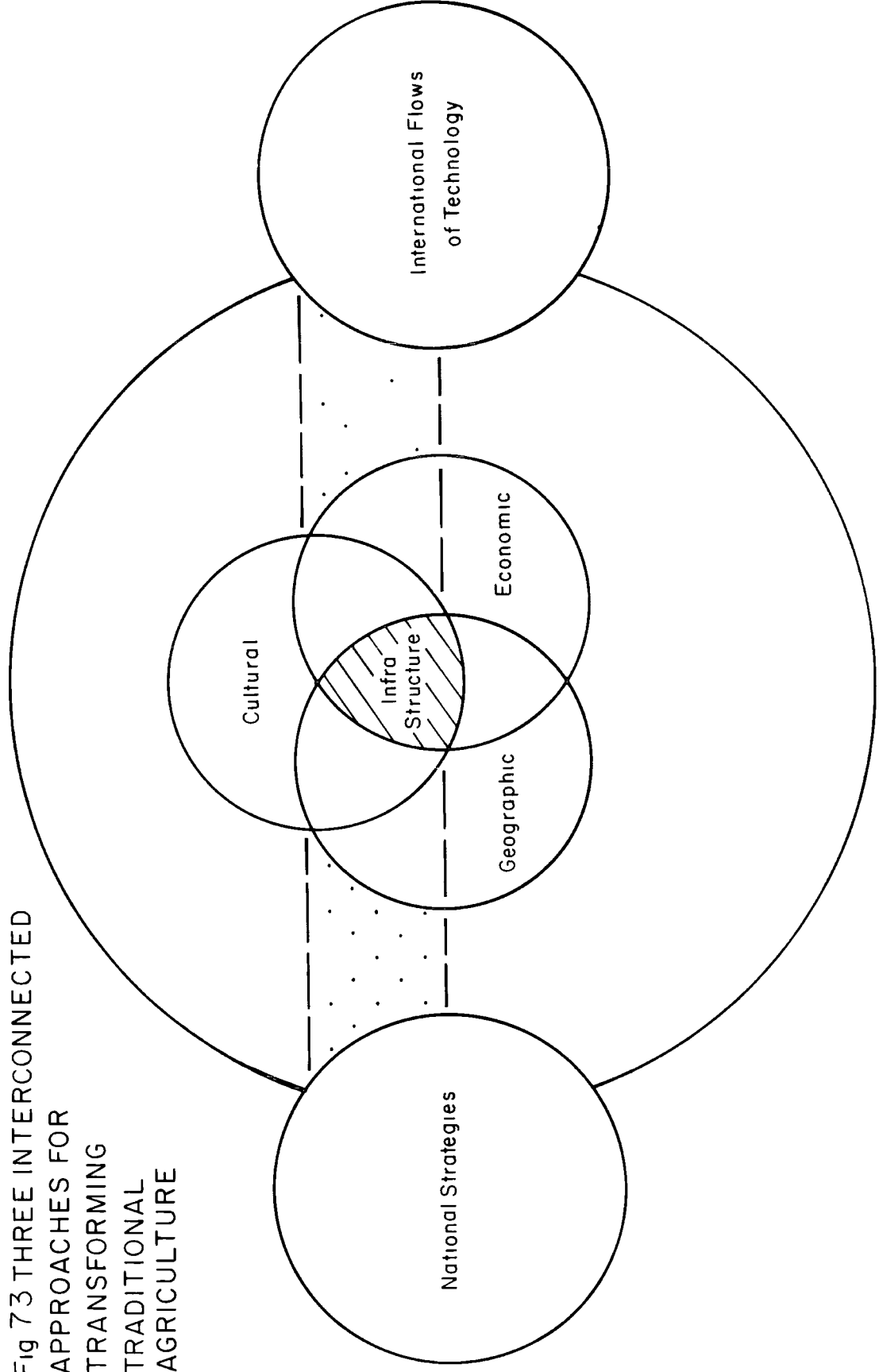
Secondly, some farmers seem to be discouraged by spending a great deal of money on digging wells where water does not exist in economical quantities or exists but requires deep digging. In both cases the farmers loose most of their capital.

These problems have been mitigated by means of exploring stations not only by virtue of developing new wells but also through supplying the farmers with scientific information which indicate the potential areas of water

with a minimum risk. Furthermore, both an appraisal of Saudi Arabia policy and the prospects of agricultural development in the western areas can be achieved by means of the three approaches combined, (Fig. 7.3.) Settlement projects are examples of encouraging specialisation in order to improve traditional techniques, which has been followed by other steps such as subsidies and credit facilities, while the Saudi Agricultural Bank, MAW and the General Desalination Agency are designed to alter the structure of traditional agriculture on a long-term basis.

To sum up, careful utilisation of the three approaches may provide the planners with criteria for both the appropriate choice of techniques and directions for investments.

Fig 73 THREE INTERCONNECTED
APPROACHES FOR
TRANSFORMING
TRADITIONAL
AGRICULTURE



CHAPTER EIGHT

Conclusion

The dynamic processes of transforming traditional agriculture in Western Saudi Arabia have been dealt with under the four factors of production: land, labour, capital and traditional co-operation. It is hoped that examination of these key factors of production has revealed clues for future strategy and the eventual attainment of government objectives. For this purpose, i.e., long-term prospects, an emphasis has been placed on the mechanism underlying the relationships between the average Arab farmer and his environment, as in the case of land and Islamic institutions which determine land use.

Prospects of agricultural development both spring from, and are affected by it. The various types of land ownership not only seem to be flexible to accommodate a wide range of agricultural activities but also tend to respond to human incentives and investment conditions. One cannot ignore the obvious limitations revealed by this study. However, such limitations lie on the social side and the structural problems of socio-economic conditions. The clarification of land concepts and a certain terminological confusion show that such limitations need not be serious constraints on future developments. The inherently flexible quality of the Islamic land system reflects itself through the spatial economic

structure which characterises Western Saudi Arabia.

Moreover, such characteristics tend to draw broad lines between the areas in which traditional private initiative should be encouraged and other spheres where governmental intervention is needed to inject fresh investment. To advance the present processes of transforming traditional agriculture it seems obvious that the government should choose gradual strategic measures according to the requirements underlying the spatial economic factors of Western Saudi Arabia.

Labour is another determining factor in the production techniques since the agricultural work force is affected by Arab cultural traits and trends in bedouin migrations. For, despite the constant migration which has produced the present farmers and permanent settlement in the major towns of Western Saudi Arabia, there are some indications that attachment to land, spatial variations and cultural traits are self-perpetuating. As a result, labour attitudes toward work tend to delay the processes of progressive transitional adjustment.

Investigation of these issues and other aspects of traditional agriculture has thrown some light on the nature of the complex reality of transforming traditional agriculture in Western Saudi Arabia. Behavioural geography has been emphasised throughout this study in

order to examine the variations of practical problems and to indicate the possible future course of behavioural academic perspectives in developing nations. If something is to be learned from the experiences of Western Saudi Arabia, it is that the various types of bedouin migration have tended to form a rural - urban drift typical of most developing countries. Yet this is not to say that solutions applicable to Saudi Arabia are necessarily transferable to other developing countries. Stopping rural migration is usually advocated in most of the Arab countries. Experience in Western Saudi Arabia tends not to support this sort of strategy since migration flows are affected by three factors : economic development, locational problems, and -- more important -- traditional agricultural change. These factors involve certain adjustment processes that do not lend themselves to restrictive measures for migration. After all, it is such processes which have brought about traditional agricultural change in the area under study.

One prospect which appears promising is reflected in the improving living standard and the trends towards innovation that are certainly affecting the labour market in most of Western Saudi Arabia areas. As a consequence, specialised farms are increasing in the old as well as the newly developing areas.

Capital is treated as a third changing variable in relation to agricultural techniques. Western Saudi Arabia possesses potential traditional capital which requires a new approach if transforming traditional agriculture is to be accelerated. One indication that emerges from the study is that there are two perspectives for developing traditional capital: one is the asabiyya concept of mutual obligation for strengthening the co-operative traditional farms, particularly in the mountains of Western Saudi Arabia where absorptive capacity of such farms is limited. The other perspective for developing traditional capital lies in the spatial organisation within the Hijaz mountains. The farming system in these areas is based on private ownership, at the same time, is within well-defined tribal districts. Asabiyya is a possible measure, and perhaps effective means for encouraging new methods of co-operative farming and for providing help in choosing locations for developing co-operative farms.

Western Saudi Arabia is experiencing new capital developments which are innovative trends in the processes of agricultural transformation. The tendency to diffuse new capital formation shows in a variety of ways. For example, increasing the use of fertilizers and improving irrigation systems are fundamental changes, if not dramatic developments, underlying the processes of transformation.

The sequential nature of modern capital is confronting the government with certain problems such as marketing and distribution of agricultural equipment. The problems of transforming traditional agriculture in Western Saudi Arabia suggest that the solution to modern capital shortage involves short and long-term capital arrangements which in turn depend on locational and spatial adjustments.

The Khaldounian geographic model maintains that time and space are determinant variables for human co-operation and agricultural surplus. Ibn Khaldoun's model further indicates that processes of transitional society in general (and the bedouin in particular) tend to involve synchronisation of stages. Thus, types of social organisation and the level of co-operation affect the quality of division of labour and constitute a prime cause for eventual dexterity that might lead to agricultural surplus.

Ibn Khaldoun's over-emphasis on behavioural geography tends to imply an environmental determinism which no modern scholar can accept. He introduced an encyclopedic treatment of Hijaz and other related issues significant to three sort of scholars. First are the geographers who want to investigate the locational aspects of asabiyya which reveal a potential solution in the sphere

of voluntary co-operation, whether in traditional farming or in hima (which dominates most of Hijaz mountains).

The second and third groups of scholars are the sociologists and the economists who may find the Khaldounian model useful for settlement projects. This may well be the case in Western Saudi Arabia where the changing social and economic conditions require careful consideration of the cultural heritage which provides the material of the present society and the impact of oil on the traditional social fabric. This is by no means to claim that these disciplines have been integrated but rather to indicate the pressing need for coordinated efforts, whether at the local level or through the Ministry of Planning at national level.

This thesis has revealed the challenge underlying the conditions of traditional agriculture (Part One), and the sort of response that may indicate the future prospects (Part Two). This was schematically represented in Fig. i.

The hijras of King Abdulaziz not only represent a point of departure in the processes of transformation but also reveal the background to traditional agricultural change.

No one can claim that if the hijra programmes for Western Saudi Arabia were repeated today, any genuine

agricultural change would be produced. Equally however, no successful structural transformation can be achieved without full grasp of the past events which have affected present-day agricultural structures in many ways.

Moreover, hijra indicates some courses of action to fulfil the requirements of successful social programmes aiming at altering the overall structure of traditional agriculture. Agricultural transformation requires sequential steps, starting with the planned radical removal of the constraints and their symptoms. Agricultural techniques before the hijra were archaic, insufficient and dominated by pastoralism. The remedy suggested by the hijra for this and similar situations entails three basic conditions. The first is a geographic shift in terms of community settlement and selection of suitable locations. The second is not to abandon traditional agriculture but to encourage specialisation within it instead. This is in order to avoid sudden change in the traditional society which might lead to adverse results. The third step, which stems from the second point, is to alter the occupational structure as has happened gradually in the main towns of Western Saudi Arabia.

The quality and the nature of the geographic position of Western Saudi Arabia seem conducive to both agricultural change and cultural orientation toward

adopting new techniques. The hijra which contributed to and vitalised this quality marks the first phase of agricultural transformation of Western Saudi Arabia.

The implementation of the present national programmes mark the second phase in the processes of transformation. Efforts to increase agricultural productivity involve strategic and human considerations typical of most of the developing nations. Shortage of water, small size of land holdings and labour problems are almost constant constraints on agricultural development in Western Saudi Arabia. The appropriateness of the techniques which solve these problems is governed by the criteria of overall national objectives, consistent with the transitional nature of Western Saudi Arabia.

Development of national institutions is an essential element for effective adoption and diffusion of modern techniques. In order to diffuse modernisation through the major factors of production these institutions will change in both function and design. For this reason, improvements in national institutions, i.e. M A W and the Agricultural Bank, tend to occur on two levels: enlargement and development. The former represents a positive response to the various activities of modernising traditional agriculture not only in Western Saudi Arabia but also at the national level. The latter involves keeping up with newly-developed agricultural techniques in advanced countries. For

instance, joint research projects in Al-Hasa and contracts with some international firms in Western Saudi Arabia are dramatic aspects of how traditional agriculture can be changed through national institutions.

Oil development is influencing agricultural research in terms of national objectives. On the one hand oil revenues have made it possible to allocate sums of money for agricultural projects unknown to the country before the discovery of oil. On the other hand, planners are aware that the nation is threatened by an eventual oil depletion or possible oil substitution. Agricultural policy, whether in Western Saudi Arabia or any other part of the country, is therefore geared -- as it should be -- towards altering the present economic structure and diversification.

One disadvantage of the present transitional era is that the government is fighting on several fronts in its research and development programmes, having started only a few years ago from almost nothing. An advantage of such a policy, however, is that agricultural research can be integrated with national policy. The growth of local demand for agricultural technology in Western Saudi Arabia is one area in which the government has achieved satisfactory results. This is, among other things, due to the way in which the branches and activities of MAW and the Agricultural Bank have been located throughout the various provinces.

Experience in Western Saudi Arabia reveals other related social problems. Skill creation and skill development are not only immediate problems but also long-term issues underlying the future prospects of agricultural development. To create favourable conditions for the application of appropriate technology the long term policy should aim at structural transformation. These conditions are unlikely to be achieved in the absence of economic and social conditions that provide background for agricultural development. Somehow such conditions seem to be initiated by hijra programmes and the present government policy is an extension of these in certain respects, e.g. its settlement programmes.

It is hard to assert that settlement projects have led to any immediate increase in the level of agricultural productivity. This fact, however, does not affect the evaluation of the long-term prospects which seem promising. After all, the national objectives are orientated towards long-term adjustments and structural transformation, which are not expected to result in fundamental changes in the short-term. This is because agricultural prospects in Western Saudi Arabia seem to depend on whether or not favourable conditions for development exert effective influence on the traditional sectors, i.e. livestock, and remote farms within

mountainous districts. The newly developed areas in the proximity of Madina and Jedda reflect the continuity of agricultural change more obviously than any of the remote areas in Western Saudi Arabia. While main roads and agricultural roads cover substantial areas of Western Saudi Arabia, there are still traditional farming areas and grazing districts which depend on traditional paths.

The past hijra programmes provided an important juncture for social and agricultural development, and yet the impact of this policy has varied according to the circumstances and the way in which the distribution of the settlements was directed. For instance, the national agricultural policy today, whether in Eastern or Western Saudi Arabia, is an extension of hijra, particularly in regard to the issues of fostering social integration through settlement programmes. Even today settlements in north Western Saudi Arabia are called hijar (Plural of hijra) and are aiming at the same national objectives though from a different angle. The hijra concept and function have tended to become part of public land programmes because the national objectives are affected by two factors, namely the performance of traditional agriculture and the stages of social and economic development.

Regardless of the names given to the programmes, it would appear that Western Saudi Arabia requires new distribution of both subsidies and settlements to favour the

remote areas because the proximities of the major towns have already attracted private settled farmers. A combination of the present programmes of subsidies and modification of the settlements appear to be the most effective policy aimed at modernisation. There are new trends which are in fact paving the way for more emphasis on the private initiative through 'indicative measures'. For one thing, the new financial methods referred to in this study are a creation of oil and not wholly in the control of the government. Moreover the Agricultural Bank, besides its present functions, could be a useful instrument for promoting self-finance and selective subsidies. Such short-term measures act as catalysts underlying the long-term prospects.

Another aspect, underlying the long-term prospects, grows out of the international transfer of technology. Special consideration should be given to the general setting of Western Saudi Arabia as an area of Muslim farmers who are sincere in not wanting to adopt any techniques which may be interpreted as a deviation from Islamic traditions. More important, Islamic ideas -- old as well as new -- are dynamic forces that tend to outweigh economic incentives.

At the same time, Western Saudi Arabia possesses a unique geographic position and occupies a special place among the Islamic countries. These aspects tend to

influence agricultural developments in two ways. One is that the history of the country records constant contact with the outside world, and the second stems from the fact that Western Saudi Arabia contains the Holy Towns of Makka and Madina.

Such circumstances have given rise to what might be called a sort of 'pull-push' mechanism in terms of ideas and intellectual attitudes towards adoption of technology. The reaction to western technology is as old as the contact between the West and the Middle Eastern countries, yet it is precisely this old contact that reflects itself in the cultural heritage and Islamic legacy which determine the attitudes toward adoption of new techniques. The Western Saudi Arabian farmers -- with whom the present author has had long experience -- are faithful to their religion, watching any new techniques with much caution or even suspicion.

The illiterate farmer is faced with two sources of problems: the advice of agricultural experts on the one hand, and the heritage of Islamic tradition on the other. So, whenever, supposed or real conflict arises between Islamic tradition and introduction of new technology, it is usually the latter which gives way. Moreover, those who hold passive attitudes or are reluctant to apply certain agricultural techniques cannot be persuaded to change their

attitudes except by the means of traditional Islamic interpretation of the new issues. Such problems as they exist in contemporary Western Saudi Arabia suggest the dimensions of transforming traditional agriculture which in turn may offer possible solutions. One particular solution lies in the composition of each team of agricultural experts. They might consist of economists, agronomists, geographers, sociologists, other social scientists, Islamic experts, shiekhs and historians. A second possible level for the effective implementation of technology might be to establish three departments in MAW. These would be the cultural department, the economic department and the geography department. Their functions would mainly be in fieldwork in order to provide the various technical departments and the joint research department (which are already in existence) with data and any relevant information. The third level solution is to revitalise technical education by improving the curriculum for the future of agricultural experts. This could offer a practical solution to facilitate the adoption of technology in Western Saudi Arabia.

Any strategy for technological transfer for agricultural development in this area requires channelling certain individual attitudes into constructive uses through scientific enquiries and research development. Technical

feasibilities of agricultural projects may not be attained without taking social fabric and the extent of social acceptability into account. Thus agricultural prospects in Western Saudi Arabia depend on getting the farmers involved in the processes of agricultural transformation, such as involvement in planning, implementation and, more important, persuading and motivating them through cultural values and economic incentives. The present writer believes that the adoption of technology, for this area, must rest on a combination of Islamic teaching and cultural values which represent a dynamic force in all traditional sectors of agriculture, not only in Western Saudi Arabia but also in any part of Islamic world.

Both Arab and Western scholars have examined the relationships between Islamic culture and application of science not only in the context of the long history of contact between the West and the Arabs, but also from the points of view of agricultural and economic perspectives. The studies of such scholars can be divided into at least three broad approaches dealing with strategies for effective transfer of technology: the cultural approach, the geographic approach and the economic approach. There is one single issue that unifies these approaches and that is the broad strategy for the transfer of technology. Scholars may be formulating different questions,

and yet nevertheless they are all seeking a practical solution for developing traditional agriculture.

These sets of enquiries may be grouped under three questions: First, the geographers and other scholars seem to prefer the cultural approach, in terms of location and behavioural geography, so the question of these problems to be asked centred around where, e.g. O'Leary who was quoted in the first section of Chapter VII. Second, the economists adhere to the cultural approach but stress the question how the transfer of technology can lead to profitable agricultural projects. Third, each one of these approaches seeks to provide an answer to the question why certain technological strategy entails appropriate agricultural techniques.

The three approaches overlap and inter-relate in many respects, particularly in the sphere of practical problems, i.e. the location of agricultural projects and the need for the development of infrastructure.

An attempt has been made in this study to throw some light on the complex reality of transforming traditional agriculture in Western Saudi Arabia. This is a situation that has led to some limitations. Though the study has examined certain spatial and locational

problems in the context of behavioural geography, the subject itself may still appear marginal to geographical science. Nevertheless it is hoped that this study indicates a new direction for behavioural geography in future studies yet to be written.

S E L E C T B I B L I O G R A P H Y

This bibliography contains all works referred to in the text of the thesis and in addition other references of direct relevance to the subject. Other works of a more peripheral interest only have been omitted.

Note: The following abbreviations have been used in the bibliography:-

- (a) in Arabic
- (r) restricted
- (u) unpublished

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C. Periodicals	Nos. 91-241

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